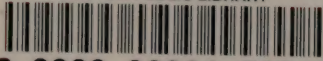


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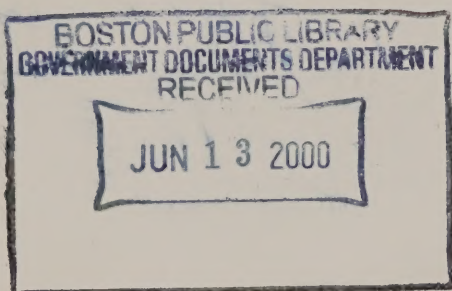
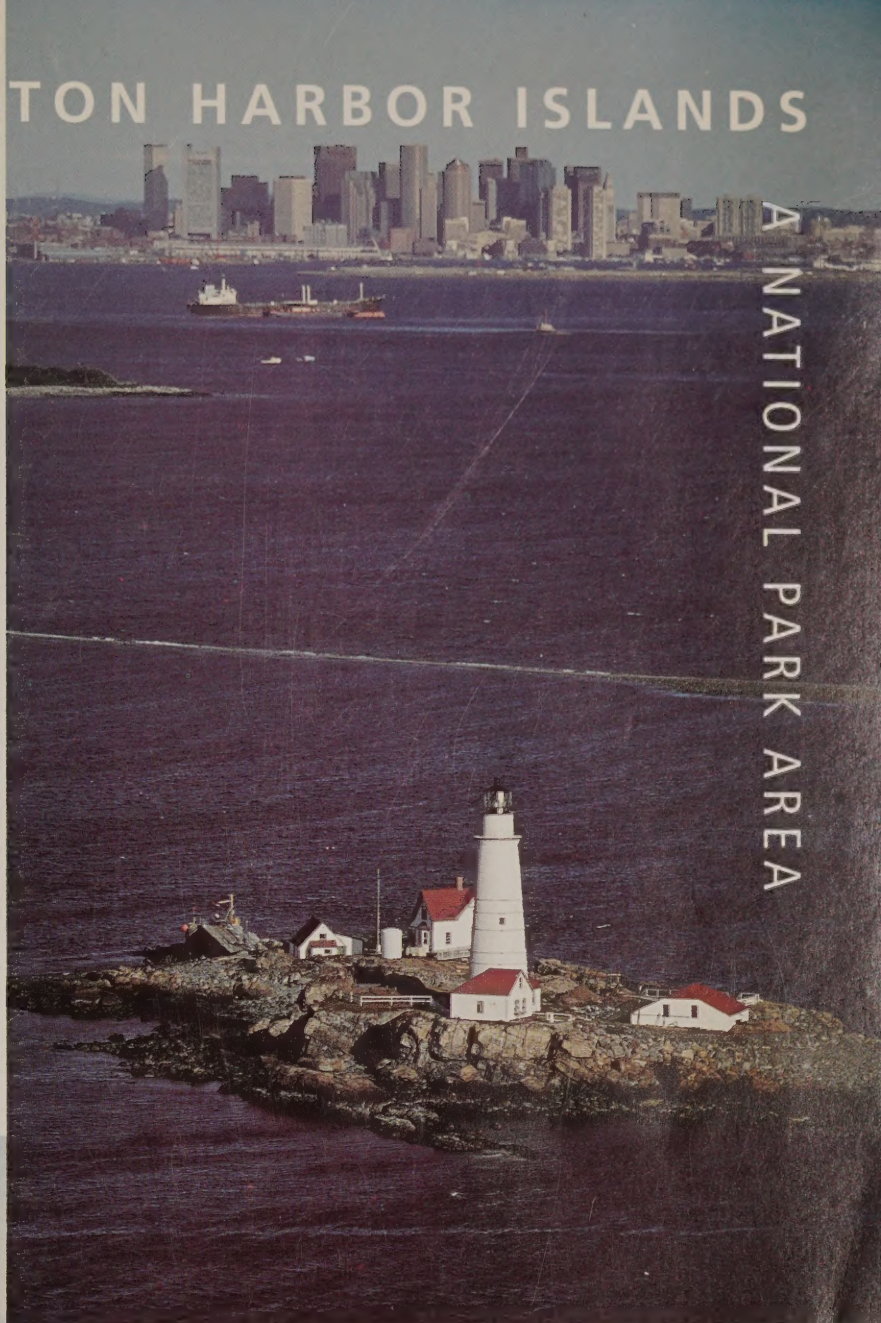
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BOSTON HARBOR ISLANDS

A NATIONAL PARK AREA



gov. 00-1650

Draft General Management Plan and
Draft Environmental Impact Statement



BOSTON
HARBOR
ISLANDS

A national park area

May 30, 2000

Dear Reviewer:

I am pleased to enclose a copy of the Draft General Management Plan/Draft Environmental Impact Statement for the Boston Harbor Islands national park area. I encourage you to review the document before the close of the public comment period on August 1, 2000.

The draft plan describes the Boston Harbor Islands Partnership's vision for the next two decades. Developing the draft plan has given us the opportunity to participate with dedicated people from different backgrounds who share a common vision. That vision is to realize the full potential of an island park in metropolitan Boston. We invite you to join us in this ambitious and exciting undertaking.

Please send your comments (a response card is enclosed in the draft) to:

George Price, Project Manager
Boston Harbor Islands
408 Atlantic Ave., Suite 228
Boston, MA 02110-3349
Fax: 617-223-8671

Following public review, the Partnership will propose a final plan based on the comments received, applicable policies, and the feasibility of recommendations. We look forward to reading your comments.

Sincerely,

George E. Price, Jr.
Project Manager/Superintendent

Enclosure

408 Atlantic Ave
Suite 228
Boston, MA
02110-3350

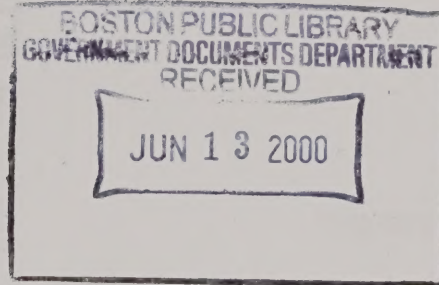
Park Information
617.223.8666

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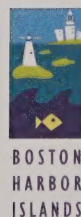
BOSTON HARBOR ISLANDS

A NATIONAL PARK AREA



Boston, Massachusetts
April 2000

Prepared by
Boston Support Office
of the Northeast Region
National Park Service
for the Boston Harbor Islands Partnership



DRAFT GENERAL MANAGEMENT PLAN

THE PARK AND THE PLAN

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EXECUTIVE
SUMMARY

E X E C U T I V E S U M M A R Y

This document presents a draft of the first general management plan for this newly established national park area and a draft environmental impact statement for alternatives being considered for the Boston Harbor Islands. The draft general management plan and draft environmental impact statement are being offered by the Boston Harbor Islands Partnership for review and comment.

PARK RESOURCES

The Boston Harbor Islands national park area contains some 30 islands (and former islands) lying within Boston Harbor. They range in size from less than 1 acre to 214 acres and together embrace 1,600 acres of land over an area of 50 square miles. The park incorporates the 16 islands of the Boston Harbor Islands State Park established in the 1970s.

Unlike islands typical of the New England coast, many of the Boston Harbor Islands are drumlins at their cores—glacier-formed, asymmetrical, elongate masses of till formed into smooth-sloped hills on the Boston Basin lowlands. With more than 200 mainland drumlins in eastern Massachusetts, these harbor islands are part of the only drumlin field in the United States that intersects a coastline. Several islands are not drumlins but bedrock outcrops.

Harbor water quality has improved over the past 10 years, as a wastewater treatment system for metropolitan Boston eliminates waste discharges into the harbor. Recreational activities such as swimming, fishing, and boating have increased as urbanites return to the harbor and the islands, and as national and international visitors discover the islands' cultural and natural history and opportunities for recreation close to a major tourist destination.

The islands, known to have been used or inhabited 8,000 years ago, had been cleared to

support agriculture and then various types of development. Today, the vegetation is predominantly grasses and sumac. Successional communities, including aspen, pine, birch, and white poplar, are found on portions of several islands. Boston Harbor and its islands provide shelter and food-rich habitats for fishes, invertebrates, marine mammals, and birds as well as nurseries for their young. Since Boston Harbor is part of the Gulf of Maine, its fauna is representative of the larger body.

Many of the Boston Harbor Islands contain buildings and structures related to uses such as coastal defense, agriculture, commercial fishing, year-round and summer habitation, resort life, industry, public health, immigration, and social welfare. More than 100 buildings and structures, including sea walls, forts, lighthouses, gun emplacements, concrete bunkers, wood-framed cottages, and brick military and institutional buildings, reflect the long history and changing character of the Boston Harbor Islands. The park contains three national historic landmarks: the Civil War-era Fort Warren on George's Island; Boston Light on Little Brewster Island, the oldest lighthouse site in the United States; and Long Wharf in downtown Boston, the longest continuously operating pier in the country. The Boston Harbor Islands contain numerous cultural landscapes, that when combined with the historic structures, archeological resources, and associated collections and archives, relate the history and character of a variety of cultural communities in the vicinity of Boston Harbor.

The Boston Harbor Islands contain evidence of American Indian use of such archeological significance that, to date, 21 islands have been designated within an archeological district listed on the National Register of Historic Places. The park's enabling legislation directs that park managers include programs to protect Indian burial grounds and sites associated with the King Philip's War.

A substantial museum collection related to the Boston Harbor Islands, comprising more than 6,000 items, is scattered among more than a dozen organizations, ranging from local, city, state and federal agencies and repositories, to private and nonprofit groups and institutions. The collection includes archeological, archival, historical, and natural history objects in a variety of print and nonprint formats.

ESTABLISHMENT OF THE PARK AND CURRENT MANAGEMENT

Congress established the Boston Harbor Islands as a unit of the National Park System in 1996. Rather than having the National Park Service (NPS) own and manage the park, the law makes NPS a nonland-owning participant in the Boston Harbor Islands Partnership and directs the Partnership “to coordinate the activities of the Federal, State, and local authorities and the private sector in the development and implementation of” a general management plan. The enabling legislation established a 13-member body consisting of: National Park Service, U.S. Coast Guard, Massachusetts Department of Environmental Management, Metropolitan District Commission, Massachusetts Water Resources Authority, Massachusetts Port Authority, City of Boston, Boston Redevelopment Authority, Thompson Island Outward Bound Education Center, The Trustees of Reservations, Island Alliance, and Boston Harbor Islands Advisory Council.

The legislation also established the Boston Harbor Islands Advisory Council (currently 28 members), with two seats on the Partnership, whose purpose is to advise the Partnership on the development and implementation of the general management plan. A unique aspect of the park is the Island Alliance, a nonprofit organization, with a seat on the Partnership, charged in the legislation with generating private funding for the park.

The Boston Harbor Islands national park area is operated day to day by the agency property owners and managers who work through the Partnership to introduce consistency and coordination parkwide and to create parkwide programs. Several member agencies bring the experience of managing island properties for many years.

The National Park Service’s role is to help coordinate the Partnership and Advisory Council, to provide information and orientation to the public, to develop and operate programs, and to help assure that the park will be managed to NPS standards, as the law requires.

PURPOSE, SIGNIFICANCE, AND PARK GOALS

The purpose of Boston Harbor Islands national park area is three-fold: to preserve and protect a drumlin island system within Boston Harbor, along with associated natural, cultural, and historic resources; to tell the islands’ individual stories and enhance public understanding and appreciation of the island system as

a whole; and to provide public access, where appropriate, to the islands and surrounding waters for the education, enjoyment, and scientific and scholarly research of this and future generations. The park’s significance derives from its array of resources: the islands and peninsulas containing archeological resources, historic sites, open space, wildlife habitats, and relatively undeveloped shoreline in an major urban area of the country; the only drumlin field in the United States that intersects a coast, formed by the glaciers some 15,000 years ago; opportunities for solitude and personal renewal, and land- and water-based education and recreation with potential to serve visitors from the region and around the nation.

This plan describes mission goals for the park—which capture the essence of the park’s vision and articulate ideals of the Boston Harbor Islands Partnership—and policies related to each goal. The goals and policies are treated by subject: (1) resource protection, (2) research and information, (3) visitor access, use, and enjoyment, (4) education and interpretation, (5) management and operations, and (6) external cooperation.

DEVELOPING THE ALTERNATIVES

The thrust of the general management plan is the unification of the park into one entity managed by numerous agencies and organizations, and development of a set of goals, standards, and policies to be broadly endorsed by the park’s constituents. In keeping with the NPS Director’s Order for Planning, this plan presents policy-level guidelines, rather than site-specific and project-level plans, and is meant to guide the park for 15 to 20 years. This approach is especially useful because the primary need in this park is cohesion and unity within a large managing body of separate and independent entities. This plan thus contains the groundwork on which future actions will be built.

A National Park Service planning team has worked with the Partnership to write this draft general management plan, making frequent reports to the Partnership and the Advisory Council, and consulting with the general public, various advocacy and interest groups, and the agencies and organizations that own and manage property in the park. Resource data on the island system has been gathered and analyzed on an ongoing basis. The broad concepts for management were developed, and a range of visitor experiences and resource conditions were identified and described in

six management areas (management zones), ranging from the conditions at mainland ferry departure points, to resource conditions and visitor experiences on remote, largely natural, islands.

Two alternative concepts (A and B) were developed and described. After discussion with Partnership and the Advisory Council members, the Planning Committee concluded that a third alternative concept was needed, giving strong emphasis to preservation of resources, while identifying certain islands for more intensive use. A strong consensus then developed around the concept of Alternative C, which received the unanimous endorsement of the Partnership and the Advisory Council as the preferred alternative for the draft general management plan. All members of the Partnership including the Advisory Council have reviewed early drafts of this Draft General Management Plan/Draft EIS. The no-action alternative is the continuation of current management with no additional funding from the NPS, and the continuation of separate and sometimes divergent policies applied to islands by each manager. Alternative A emphasizes preserving resources whereas Alternative B emphasizes providing activities for the visitor. Alternative C focuses on the large, previously developed islands for a high level of visitor activity with the protection of resources, and leaves the more remote islands in a “natural” management area with few visitor amenities.

ATTRIBUTES COMMON TO ACTION ALTERNATIVES

Many attributes are common to Alternatives A, B, and C. Of the 30 some areas considered in this plan, 16 would be expected to undergo little or no change in infrastructure. All three alternatives list the same potential mainland gateways—passenger ferry departure points with information and orientation for the park visitor. As the park evolves, as the visitation grows, and as the water transportation system is able to sustain expanded service, additional gateways would be designated by the Partnership. All three alternatives designate Spectacle and George’s as “hub” islands for passenger ferry and visitor services.

Areas of special uses also are the same in all three alternatives. The special use designation recognizes the distinctive areas of the park that will not undergo change through this general management plan. These areas are found on Deer and Nut islands, which have wastewater treatment facilities; on Long and Moon islands, which have social service and public safety

facilities; and on Thompson Island, which has an educational campus.

Natural resources would be monitored to avert over-use, with emphasis on critical or sensitive resources; cultural resources would be preserved according to the Secretary of the Interior’s standards for treatment of historic properties. Carrying capacity ranges would be established for each management area using a scientific analysis of resource impacts together with visitor experiences. Under all action alternatives, the Partnership would encourage a range of research needed as the scientific basis for resource management.

For visitors, a park identity system would be developed and a system of mainland information kiosks, wayside exhibits, and other interpretive media would orient passengers before they embark on a ferry. There would be an increase in number of visitors overall, although the distribution of visitors would not be even throughout: some islands would have few or no visitors while other islands would have many. The water transportation system is designed to provide visitors with access to the park; it would be operated by private boat operators under contract to the Partnership or its member agencies. The system would be monitored and evaluated periodically and adjusted as needed.

Islands would continue to be managed by existing managers with overall policy established by the Boston Harbor Islands Partnership. Each island open to the public would have resource protection, interpretive, maintenance, and administrative staff necessary to maintain parkwide standards. Coordination among island managers would be done by the Partnership, and staff support for the Partnership and the Advisory Council would be provided primarily by the NPS with support by Partner agency personnel as available.

Any infrastructure development undertaken would support park goals. All new infrastructure would be sustainable, make use of renewable resources, and would be guided by a “green” philosophy. Potential changes include: handicapped-accessible piers, visitor contact stations and visitor centers, utilities in certain areas, an American Indian cultural center, lodgings and campsites, administrative facilities, maintenance facilities, staff housing, adaptive reuse of historic structures, removal of some deteriorated structures, rehabilitation of some landscapes, boat moorings, and rental facilities for water sports. Estimated capital costs would range from \$61 million to \$88 million, with a

special initiative for Peddock's Island undertaken in collaboration with the private sector estimated at an additional \$16 million to \$57 million. "Gateways" on the mainland could range from \$4 million to \$20 million. Total annual cost of operations would be approximately \$8 million under the action alternatives. Differences would be found in the differing emphasis placed on resource protection, visitor activities, and programs. Funds for park operations would come from all partners, except the Advisory Council, and from private sector funds raised by the Island Alliance. Federal funding would be provided in the ratio of one-to-three, federal-to-nonfederal dollars. The National Park Service and the other public entities would be expected to fund large infrastructure projects throughout the system, again in the ratio of one-to-three, federal-to-nonfederal dollars. In all alternatives, revenue could be expected from park-related revenues, use fees, and income from commercial operations such as rentals, boat excursions, food sales, and events such as concerts.

THE PREFERRED ALTERNATIVE

Alternative C, the preferred alternative, gives emphasis to the preservation of island resources, while concentrating activities for visitors in designated areas. Although potentially, five "hub" islands could be developed, the initial and primary hub islands would be George's, Spectacle, and Peddock's; secondary hubs could be established at Long and Deer if ferry service demand warranted it. In general, "hub" facilities would be concentrated close to the pier and would include visitor contact stations, restaurants or food concessions, boat rentals, and small venues for events like concerts, historical pageants, and educational presentations. Facilities would be improved to emphasize resource protection throughout the park and the accommodation of visitors in designated areas of the park.

In the preferred alternative, park managers are challenged to provide visitors with creative, educational programs that provide meaning and bring the resources alive. The visitor has a menu of choices about where to go for a range of experiences, from immersion in cultural or natural history to recreational activities with resources as the backdrop. Visitors experience the park in its multifaceted possibilities, which focus attention and programs on cultural and natural history of the islands. Active management would conserve or preserve resources. Efforts would be made to engage volunteers in stewardship of resources.

POTENTIAL ENVIRONMENTAL IMPACTS

The potential impacts of no federal action and the three alternative actions, A, B, and C, were evaluated, and a summary of impacts is included in the draft environmental impact statement for air resources, coastal processes, water quality, soils, upland vegetation, terrestrial wildlife, wetland and aquatic vegetation, wetland and aquatic marine wildlife, protected species, special communities or habitats, cultural landscapes, archeological and ethnographic resources, historic buildings and structures, museum collections, and socioeconomic factors.

In general, Alternatives A and C would have fewer negative impacts and more positive impacts on natural resources than Alternative B. Negative impacts on natural resources from an increase in visitors would be mitigated. The condition of cultural resources would be improved in all alternatives over no action, with Alternative B providing the fewest positive impacts. Based on the NPS "money generation model," all alternatives would have positive impacts; Alternative B would provide the most revenue, taxes, and jobs for the region. The alternatives improve the overall condition of natural and cultural resources and provide positive socioeconomic impacts.

NEXT STEPS

The draft general management plan and draft environmental impact statement (DEIS) will be available for public review for 60 days. Following public review, a proposed plan will be prepared by the Partnership, and the final draft GMP and final EIS will be published. Following a 30-day period, the plan will be submitted to the Governor of Massachusetts. Then a record of decision will be prepared by the National Park Service Northeast Regional Director for the Secretary of the Interior.

During review periods the National Park Service will accept written and oral comments. The Partnership will carefully review all comments and incorporate them, as appropriate, in the final plan and final impact statement. The National Park Service may make public any written comments it receives on the plan, including the names and home addresses of respondents; these comments may be inspected during regular business hours. Individual respondents may request that NPS withhold their home address from the planning record, which will be honored to the extent allowable by law. There also may be circumstances in which NPS would withhold from the

planning record a respondent's identity, as allowable by law. If anyone wishes to have his or her name and/or address withheld, he or she must state this prominently at the beginning of the comment. The National Park Service does not consider anonymous comments. For all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, the National Park Service will make the submissions available for public inspection in their entirety. A copy of the draft general management plan and a response form will be posted on the World Wide Web at nps.gov/BOHA/admin.

Comments should be submitted to:
George Price, Project Manager
Boston Harbor Islands National Park Area
408 Atlantic Avenue, Suite 228
Boston, Massachusetts 02110

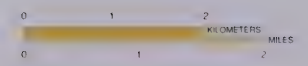
For further information, please contact the project manager at (617) 223-8666.



BOSTON HARBOR ISLANDS

Legend

- Park Islands
- Mass Transit Stop



THE PARK
AND
THE PLAN

I N T R O D U C T I O N

The Boston Harbor Islands became a unit of the National Park System in November 1996 by an act of Congress (Public Law 104-333) that contains several provisions which, in total, make this a national park like no other. This section of the draft general management plan provides a brief description of the park's setting, resources, current management, and the purpose of this, its first, general management plan.

While the official name is Boston Harbor Islands National Recreation Area, the park is known as Boston Harbor Islands, a national park area. This latter name was chosen by the Boston Harbor Islands Partnership in consultation with the National Park Service Washington office and American Indians. The reason for the choice is to foster public appreciation of the park's resources and history, such as past use of the islands by Indians, rather than to focus the public's perception solely on recreation.



Boston Inner Harbor

OVERVIEW

THE SETTING

Until 1970, when the Commonwealth of Massachusetts began to acquire them for the benefit of the public, the islands of Boston Harbor had been shielded from public view and appreciation for generations by commercial and industrial development along the waterfront and by the poor quality of harbor water. In 1985, Boston Harbor was labeled the most polluted harbor in the nation, but the dramatic recovery of water quality during the 1990s, through the Massachusetts Water Resources Authority's wastewater treatment, contributed to widespread support for establishing a national park area. Now, after an investment of more than \$4 billion in better wastewater management and treatment, the harbor appears clean and inviting. Over the past three decades, numerous public and private agencies have once again turned their focus to Boston

Harbor and its islands, as the region seeks to rebuild its historical and ecological ties to Massachusetts Bay.

The 30-some islands of Boston Harbor, ranging in size from less than 1 acre to 214 acres, have served numerous public and private uses and are a unique example of an island cluster intimately tied to the life of a city. Although within sight of a vibrant and densely populated metropolitan area, they continue to offer the visitor a rare sense of isolation. Their proximity to a large urban population and their special geological, prehistoric, historic, and natural features contribute to their national significance.

THE REGION

Boston is the most populous city in New England and a major economic, educational, and cultural center. The city itself is the twentieth most populous in the United States, but its metropolitan area, ranking seventh, is the third most densely populated in the country. Approximately 7 million people live within a 50-mile radius, or an hour's drive of, downtown Boston, and 40 million people live within 250 miles. In addition, the metropolitan area is home to 116 institutions of higher education, including Harvard University, the nation's oldest.

Boston and its immediate region contain some of the oldest, most valuable, and most visited historic sites in the nation. Boston's Freedom Trail and, more recently, its National Historical Park have drawn visitors for decades. The Society for the Preservation of New England Antiquities and other private nonprofit groups own significant historic properties. To the south is Plimoth Plantation, containing replicas of the first permanent English settlement in the Northeast and an Indian village, and today one of the best living-history museums in the country. To the northwest are Concord and Lexington, both renowned Revolutionary War sites; Concord also has important sites related to the literary and intellectual life of the 19th century. Directly north of the city, Essex County embraces the communities of Salem, Gloucester, Newburyport, and Marblehead, all significant maritime centers in the early national period.

The metropolitan area is home to 11 National Park units—the Adams, Boston, Lowell, and Minute Man National Historical Parks; the Boston African-American, Salem Maritime, Saugus Iron Works, Longfellow, Kennedy Birthplace, and Olmsted

METROPOLITAN BOSTON



National Historic Sites; and the Boston Harbor Islands. The area also features the country's oldest metropolitan park system; Boston's famous "Emerald Necklace"; the nation's first statewide conservation organization; and one of the country's first state park systems, created in 1897. The metropolitan park system, operated by the Metropolitan District Commission, was planned by Charles Eliot and Sylvester Baxter and created by the state legislature in 1893. Eliot, who dedicated his career to the system that would protect the area's remaining open spaces, understood the importance of the harbor's estuaries, beaches, and islands, and made them integral to his 1893 park plan. Frederick Law Olmsted, designer of New York's Central Park and parks and landscapes throughout the country, designed the "Emerald Necklace" of parks in Boston that have been renewed and revitalized in the 1990s. The Trustees of Reservations, established in 1891, was the model for land trusts internationally and protects more than 33,000 acres in Massachusetts.

The Boston Harbor islands form a transition zone between the open ocean and the settled coast, between the world beyond Boston Bay and the features specific to it. They are not only a physical entrance but a gateway as well to a long sweep of history, from Native American uses through the explosive growth of the city and industry and the concerns of the current post-industrial age. Both literally and symbolically, the islands offer a unique vantage point from which visitors can contemplate metropolitan growth and change.

The islands also offer an exceptional perspective on change in the region's ecosystem. Magnificent open spaces surrounded by expanses of open water, the islands vividly illustrate the region's complex geological past and the continual effect of natural processes on their habitats, their uses, even their shapes. From them, visitors can learn about how such complex ecosystems as harbors are revived. The improvement of Boston Harbor waters has regenerated the biotic communities of the islands and the sea around them and has made possible an impressively wide range of recreational uses. Thus the islands are both a recreational haven for urban residents and tourists and a highly effective teaching tool about natural change, cultural history, and stewardship.

MASSACHUSETTS BAY, BOSTON HARBOR, AND THE ISLANDS

Massachusetts Bay is a projection of the Atlantic Ocean, which stretches between Gloucester in the north and

Marshfield in the south. Its easternmost edge touches the boundary of Stellwagen Bank National Marine Sanctuary, which was established in 1992. The bay encompasses approximately 800 square miles.

Part of Massachusetts Bay, Boston Harbor, includes the shores of six of Boston's neighborhoods (East Boston, Charlestown, North End, Fort Point, South Boston, and Dorchester) and seven other municipalities: Hull, Hingham, Weymouth, Quincy, Chelsea, Revere, and Winthrop. The Inner Harbor includes the mouths of the Charles and Mystic rivers and the port of Boston, and the Outer Harbor includes the three bays of Dorchester, Quincy, and Hingham. Combined, the Inner and Outer harbors comprise approximately 50 square miles and are bounded by 180 miles of shoreline. Within Boston Harbor are the Boston Harbor Islands, totaling approximately 1,600 acres. The Boston Harbor Islands national park area extends seaward 11 miles from downtown Boston. The park incorporates the 16 islands of the Boston Harbor Islands State Park.

Boston Harbor and the islands have undergone significant physical transformation over the last 300 years. Both human actions and natural forces have caused this change. Many people are aware of the dramatic expansion of the Shawmut Peninsula by filling tidal land over the centuries to create what is now the city of Boston. However, most people are not aware of similar changes to current and former harbor islands. Natural forces significantly eroded Sheep and Hangman to mere outcroppings. Causeways and land bridges were constructed to connect World's End, Deer, and Nut islands to the mainland, as well as other former islands such as the end of what is now sections of the town of Hull and Castle Island in South Boston. A modern vehicle bridge was constructed for Long Island. Massive landfills connected Wood, Noddles, Apple, and Governors islands for East Boston and Logan Airport. Today's metamorphosis is the dramatic construction of Spectacle Island with material from the central artery highway tunnel through Boston known as the "Big Dig." Today's visitor to the islands may get the sense of permanence. However, man and nature have had a dramatic impact on the geography of this fragile resource over a comparatively short period of time.

PARK RESOURCES

For a fuller description of the park's resources, see the Affected Environment section of the Draft Environmental Impact Statement on page 76, and Appendix 3, The Islands of Boston Harbor.

GEOLOGICAL FORMATION of Boston Harbor

10,000 YEARS BEFORE PRESENT



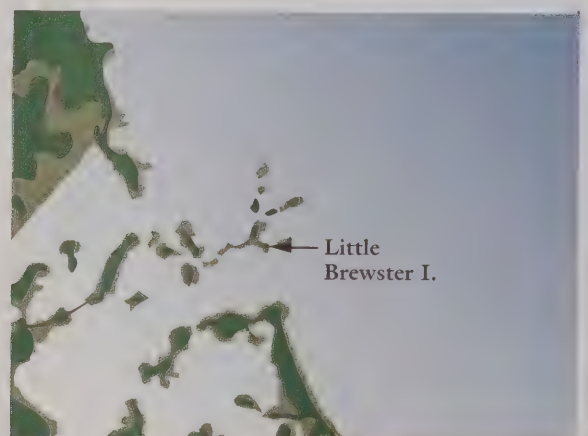
6,000 YEARS BEFORE PRESENT



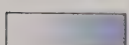
4,000 YEARS BEFORE PRESENT



2,000 YEARS BEFORE PRESENT



LEGEND



Water



Land



Current Land Forms

GEOLOGY

Boston Harbor is part of the Boston Basin, a geological feature created by a shift in the Earth's crust millions of years before the glaciers. In the past 100,000 years, two separate periods of glaciation formed the hills that became the islands of Boston Harbor and created the local drainage system, consisting of the Charles, Mystic, and Neponset watersheds. The cores of many harbor islands are drumlins—glacier-formed, asymmetrical, elongate masses of till formed into smooth-sloped hills on the Boston Basin lowlands. In profile, they look like upside-down teaspoons. As the climate warmed and the glacier receded from the Boston area some 15,000 years ago, the melting of glacial ice raised the level of the ocean, eventually creating this section of the basin and isolating the islands. (See map, page 4.)

Drumlins may occur as scattered single hills, or in so-called swarms. The Boston Harbor Islands are a geological rarity, part of the only drumlin swarm in the United States that intersects a coastline. This “drowned” cluster of about 30 of more than 200 drumlins in the Boston Basin are not all elongate in shape, as most other drumlins are (molded in the direction of glacial flow). Geologists believe the islands illustrate two separate periods of glacial action. Many of the islands have more than one drumlin.

About a dozen of the islands (the Brewsters and several Hingham Harbor islands), however, are outcrops of bedrock, their shape and size molded by glacial erosion which exposed the bedrock.

Natural coastal processes, especially northeast storms, continue to reshape the island landforms. Rates of erosion on the islands can be dramatic. In general, the highest rates of beach erosion occur along beaches facing north and east, which are the dominant directions for winds and seas in these storms. The shifting shores of Thompson Island illustrate this process of erosion and sedimentation. Human use of the islands also effects erosion by removal of vegetative cover promoting erosion, or by structures built to prevent erosion.

Every island within the park, except for those composed largely of bedrock outcroppings, has beach areas lining portions of its shores. The beaches generally most attractive to recreational users in the park are found on Spectacle (recently replenished), Long, Lovell's, and Gallop's and are primarily sandy and possess comparatively few biological resources. Rocky beaches, however, such as at Peddock's, provide excellent habitat for invertebrates and the animals that feed on them.

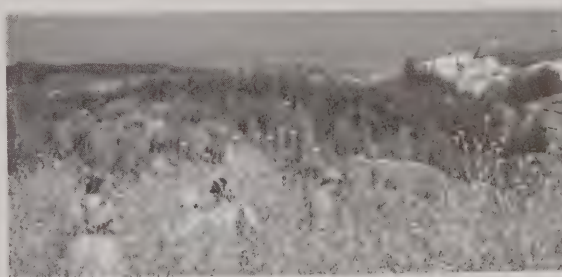
Small barrier beaches have been identified on portions of Great Brewster, Gallop's, Peddock's, Bumpkin, Long, Rainsford, and Thompson islands. Two islands within the park, Lovell's and Long, have dunes. Lovell's has the more extensive dune system, whereas Long's dunes are in one discrete area on its southern shore.

WATER

Surface water on the islands is rather limited. Perennial ponds are found on Thompson Island and World's End, and freshwater marshes are found on Long, Peddock's, Middle Brewster islands, and World's End.

Although the waters of Boston Harbor are not included within the park boundary, they wash the island shores with twice daily tides. Boston Harbor, with a tidal range of 9½ to 10 feet, has one of the largest tidal ranges in the United States. Most of the harbor varies in depth from about 3 to 30 feet, but the north and south ship channels, between the airport and Spectacle Island, and between George's Island and Hull, can reach depths of 60 feet.

The natural watershed around Boston Harbor extends as far west as Hopkinton, Massachusetts, 25 miles inland. The farthest point from which water enters the harbor is the Quabbin Reservoir about 65 miles to the west, which supplies water to Boston and more than 100 surrounding communities.



Middle Brewster Island

Today, Boston Harbor is vastly cleaner than it had been for decades. As is typical of many coastal areas near major metropolitan centers the harbor had been used for waste disposal since colonial times. Sewage from 43 municipalities now undergoes primary and secondary treatment at Deer Island, where sludge is removed and where the remaining liquid is disinfected and soon will be diffused nine miles into Massachusetts Bay.

In recognition of the improved water quality, the governor and the mayor of Boston appointed a Joint Commission on the Future of Boston Harbor Beaches to recommend a restoration plan for the waterfront and island beaches with funding of \$30 million.

Improvements range from green space enhancements, bathhouse restoration, beach nourishment, and enhanced public transportation to increased public access to the beaches.

UPLAND VEGETATION

The flora of the islands reflects a long history of human alteration. The islands' drumlins are thought to have been covered with mature forests of hemlock, maple, oak, pine, and hickory, which were cleared to support agriculture and pasturage, and to supply firewood for fuel. In addition, the construction of the islands' massive fortifications severely disrupted much of the native flora. Thorough documentation of the characteristics of the terrestrial environment has not been done, but successional species including aspen, pine, birch, and white poplar are clearly evident on most of the islands.

Most of the fertile sites found on the islands were converted to agriculture over the past 300 years. The remnants of these attempts at subsistence farming are evident in the appearance of apples, pears, grapes, chives, garlic, asparagus, and horseradish.

Today, patches of undisturbed native flora are rare on the islands, and vegetation on most of the islands is dominated by grasses and sumac. The owners of World's End and Thompson Island have continued to manage expansive grasslands that are part of the cultural landscape, and Thompson Island has the only community of mixed oak forest, covering approximately one-tenth of the island.

TERRESTRIAL WILDLIFE

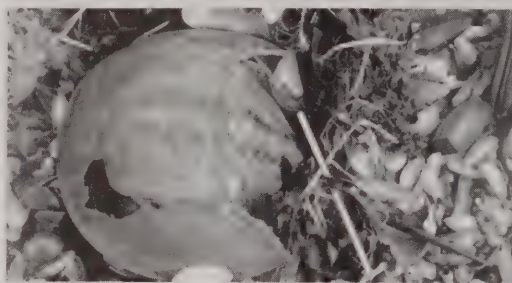
The diversity of upland and marine habitats provides good nesting and feeding opportunities for a number of bird species. Field surveys have identified more than 100 bird species including gulls, terns, herons, ducks, geese, hawks, plovers, sandpipers, doves, owls, woodpeckers, and perching birds. During migration, large numbers of shorebirds utilize the mudflats and salt marshes around the harbor, while transient hawks and songbirds regularly make use of the more remote islands, or those with suitable habitat. In late fall and winter, great flocks of waterfowl gather in harbor waters.

A few species of terrestrial mammals, including exotic species, occur throughout the islands, such as cottontail rabbits, raccoons, skunks, gray squirrels, mice, muskrats, voles, and Norway rats. Some species have been known to devastate populations of small vertebrates and nesting birds.

While no formal surveys have been conducted, Eastern garter snake, Northern brown snake, and Eastern smooth green snake are known to occur on the islands.

WETLAND AND AQUATIC MARINE VEGETATION AND WILDLIFE

The Boston Harbor Islands provide shelter and food-rich habitats for marine birds, mammals, fishes and invertebrates, as well as nurseries for their young. Much of the Gulf of Maine fauna can be found in Boston Harbor, especially around the Brewsters.



Horseshoe Crab on Grape Island

The once-plentiful eelgrass is the only type of seagrass now present in Boston Harbor; it is now confined to only four isolated areas, the largest of which is near the south coast of Bumpkin Island. Seagrass beds are critical wetlands components of shallow coastal ecosystems where they hold sediment, providing food and cover for a great variety of commercially and recreationally important fauna and their prey.

Salt marshes, highly productive ecosystems dominated by saltwater cordgrass, provide habitat for many marine organisms. The largest remaining salt marshes on the islands are found on Thompson and Snake islands. Smaller brackish marshes have been identified on Calf, Grape, Lovell's, and Peddock's. Mud flats, which generally occur on the periphery and at the expanding edges of salt marshes, are found on Raccoon, Snake, and Thompson.

Lobsters, crabs, and clams inhabit submerged portions of the islands. Mussels and barnacles cling to the intertidal zone. Jellyfish live in the surrounding waters. Several species of fish, including striped bass, bluefish, and winter flounder, live in waters surrounding the islands. Little Brewster, Nix's Mate, Shag Rocks, and other islands characterized by bedrock outcroppings contain rocky intertidal communities of rockweed and barnacles.

Harbor seals haul out on some of the outer islands. Because their feeding grounds or migratory routes are

nearby, humpback, fin, minke, and North Atlantic right whales and white-sided and striped dolphins are potential, though rare, visitors, as are harbor seals as strays or strandings, and harbor porpoises.

PROTECTED SPECIES

The Massachusetts Natural Heritage Program lists six rare species known to exist within the park, including two species listed as threatened and four of special concern. They are the birds barn owl, common tern, least tern, and northern harrier, and the plants sea-beach dock and American sea-blite.

The U.S. Fish and Wildlife Service reports several federally listed endangered and threatened species of fish, turtles, birds, and mammals near or in coastal waters of Massachusetts, but not known to be found among the Boston Harbor Islands. There are no island species on the federal list.

BUILDINGS AND STRUCTURES

Many of the Boston Harbor Islands contain buildings and structures related to such uses as coastal defense, agriculture, commercial fishing, year-round and summer habitation, resort life, industry, public health, immigration, and social welfare. More than 100 buildings and structures, including sea walls, forts, lighthouses, gun emplacements, concrete bunkers, wood-framed cottages, and brick military and institutional buildings, reflect the long history and changing character of the Boston Harbor Islands. With several notable exceptions, the buildings and structures of the Boston Harbor Islands have not been evaluated for their historical significance but will be the subject of several studies following this general management plan.

The partially restored Fort Warren, an impressive granite Third System fortification designated as a National Historic Landmark, has stood on George's Island as a major defensive post for the protection of the harbor in every conflict from the Civil War through World War II. Fort Andrews, erected on Peddock's Island in the first decade of this century, is a rare example of a relatively intact coastal fort of the Endicott Period (1888–1905) although its 26 remaining buildings and structures have suffered over 50 years of abandonment and are generally in poor condition.

Navigational aids constructed to guide ships through the often treacherous harbor waters include Boston Light on Little Brewster Island, a National Historic Landmark purported to include portions of the oldest lighthouse structure in the United States;

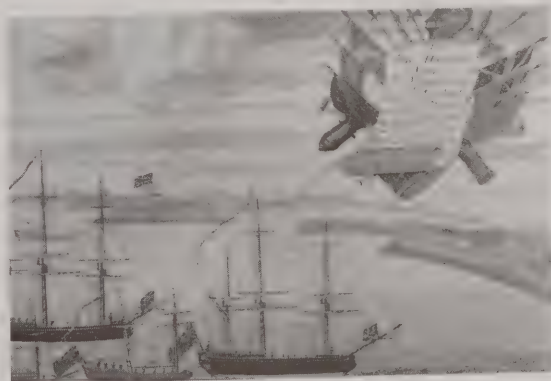
and two lights on the National Register of Historic Places, Graves Light on The Graves and Long Island Head Light on Long Island.

Approximately 40 cottages on Peddock's Island, dating from the early 20th century, are the last remaining residential structures on the harbor islands (aside from year-round institutional residences on Thompson and Little Brewster). They are occupied by their owners during the summer and allude to the former prevalence of summer communities and recreational activities in the harbor, as well as fishing communities. In recent years, the Metropolitan District Commission has been acquiring, evaluating, and removing the cottages as owners vacate them.

On Deer Island an 1889 pump station, renovated for use as a visitor center, contains a community room and exhibits of historic pumps, recalling early attempts to deal concertedly and scientifically with the region's waste water that has been discharged to Boston Harbor since 1878. Contemporary structures include 12 egg-shaped sewage "digesters" each standing 170 feet high on the southern end of the island.

CULTURAL LANDSCAPES

The Boston Harbor Islands contain numerous cultural landscapes that, when combined with historic structures, archeological resources, and associated museum collections, relate the history and culture of the people that shaped the cultural resources in the vicinity of Boston Harbor. Most cultural landscapes of the harbor islands are characterized as "historic vernacular," meaning that they were imprinted by the settlement, customs, and everyday use of people who altered the physical, biological, and cultural character of their surroundings. Fields and forests once inhabited by American Indians were later used as Euro-American farms and pastures, that, when abandoned, were transformed through natural succession into stands of



British Men-of-War off Long Wharf Before American Revolution.

The Boston Athenaeum

trees, shrubs, vines, and herbaceous vegetation. On Middle Brewster and Calf islands the stone walls, house foundations, and remnants of gardens still demarcate the summer communities that thrived prior to World War I. On Grape Island a farmhouse foundation and a lone willow tree remain, while horse pastures abandoned during World War II have reverted to tree cover.

Many islands may also be defined as “ethnographic landscapes,” those containing natural and cultural resources that associated people define as “heritage resources” such as contemporary settlements, subsistence communities, and burial grounds. Such places can be found on Peddock’s, Deer, Long, the Brewsters, and many other islands. On Peddock’s Island, a community of summer cottages, previously a fishing village, has been in active use for nearly 100 years. On Deer Island, the tragic imprisonment of “Christian Indians” during King Philip’s War marks a chapter in the region’s history and is a place of great importance to contemporary Indians.

A surprising number of harbor islands and associated peninsulas are “historic designed landscapes,” those consciously laid out by a landscape gardener, architect, or horticulturist according to design principles or by others in a recognized style or tradition. These are seen notably in the Olmsted design at World’s End and in vestiges of military landscape design on several islands. Many island landscapes are also recognized as “historic sites,” those places associated with a historic activity, event, or person. Such sites include the lighthouses on Little Brewster, whose landscape portrays the lifestyle of keepers who have tended the light for nearly 300 years, and on The Graves and Long Island.

ARCHEOLOGICAL SITES

The Boston Harbor Islands have a rich human history, some of which is revealed by physical evidence including prehistoric and historic archeological resources. The islands contain evidence of American Indian use of such archeological significance that, to date, 21 islands have been designated within an archeological district listed on the National Register of Historic Places. Archeologists assume that all islands not surveyed have potential prehistoric or pre-contact sites. In particular, the park’s enabling legislation directs that park managers include programs to protect Indian burial grounds and sites associated with the King Philip’s War.

Soils, which contain highly alkaline shell fragments, have helped preserve bone as well as remains of tools and foods that typically deteriorate in

New England soils. This, coupled with the fact that most of the islands were never long or intensively inhabited by Euro-Americans, suggests that they are likely to provide the best remaining or most easily retrievable evidence of prehistoric human occupation in the Boston Bay area. Archeologists have established that the islands were used or inhabited by humans at least 8,000 years ago, and a 4,100-year-old human skeleton unearthed on one island in the late 1960s is one of the oldest ever excavated in New England.

Archeological sites of the historic period have not been systematically surveyed, although many are known to exist on the islands. Fifteen types of sites are known: agricultural, cemetery, fishing colony, fortification, hospital, hotel or resort, industrial, poorhouse, prison, prisoner-of-war camp, quarantine, sewage treatment, lighthouses, dumps, and miscellaneous other site types.

ETHNOGRAPHIC SITES

Traditionally associated groups—American Indians, and perhaps Irish, Portuguese, military families, fishermen, farmers, lighthouse keepers, and others—have ties to the Boston Harbor Islands, but research remains to be done to determine the extent of ethnographic sites on the Boston Harbor Islands.



Courtesy of the Trustees of the Boston Public Library

Metacom (King Philip), son of Massasoit

Deer Island, to single out one island of ethnographic importance, has been used historically by Native Americans, quarantined immigrants, farmers, orphans, “paupers,” military personnel, and tens of thousands of prisoners (at the recently demolished county house of corrections), but it has special significance to American Indians as a place of internment in King Philip’s War. During the winter of 1675–76, American Indians from at least four “praying villages”—people who had become Christianized and were friendly with the English settlers—were forcibly removed to Deer Island. Estimates of people held on the islands vary, but research indicates that at least half of the American Indians on the islands died of exposure or lack of food, water, or appropriate



LAND COVER

Legend






- Drumlin Contours
- Open Land (Meadow, Scrub and Sumac)
- Wetland
- Forest
- Tidal Flat





HISTORIC STRUCTURES AND LANDSCAPES

Legend

-  National Historic Landmark
-  Lighthouse
-  Fortification
-  Cultural Landscape
-  Other Structure



medicines. Those that were finally released in May 1676 dispersed because their existing communities had become devastated. Native Americans return to Deer Island every year in October to solemnly commemorate their ancestors' suffering in this sorrowful historical chapter.

In the 1840s, when the potato famine drove a million or more Irish citizens to emigrate to the United States, Deer Island was a landing point for thousands, many sick and poverty-stricken, where the city of Boston established a quarantine hospital in 1847. Approximately 4,800 people were treated in the first two years, but more than 800 died and were buried in the Rest Haven Cemetery. In 1850, an almshouse was built to house paupers. Later institutional uses on Deer Island were a reform school, a county house of corrections, and a sewage treatment plant.

COLLECTIONS AND ARCHIVES

A substantial museum collection related to the Boston Harbor Islands, comprising more than 6,000 items, is scattered among more than a dozen organizations, ranging from local, city, state, and federal agencies and repositories, to private and nonprofit groups and institutions. The collection includes archeological, archival, historical, and natural history objects in a variety of print and nonprint formats.

ESTABLISHMENT OF THE PARK

Congress added the Boston Harbor Islands to the National Park System on November 12, 1996. The legislation (Public Law 104-333) is intended to foster the goals of current public and private land managers, including the Commonwealth of Massachusetts which began acquiring islands for the public's benefit in the late 1950s. In 1970, the Commonwealth had passed legislation (Chapter 742 of the Acts of the Massachusetts Legislature, 1970) that provided for the systematic acquisition of selected islands in Boston Harbor for recreation and conservation purposes. With that acquisition nearly complete, the enabling legislation for the Boston Harbor Island national park area focuses on ways to better coordinate the management of the park and to improve visitor programs and access. The park legislation was amended in 1998 (Public Law 105-355) with authorization to "to acquire, in partnership with other entities, a less than fee interest in lands at Thompson Island...by donation, purchase with donated or appropriated funds, or by exchange."

PARTNERSHIP MANAGEMENT OF THE PARK

National parks operate within a legal framework that applies to all units that make up the national park system. In addition, specific legislation authorizes and defines a particular park. Basic tenets of the 1996 park legislation are that: "The recreation area shall be administered in partnership by the Secretary, the Commonwealth of Massachusetts, City of Boston and its applicable subdivisions and others in accordance with the provisions of law generally applicable to units of the National Park System..." Toward that end, the legislation established the Boston Harbor Islands Partnership "whose purpose shall be to coordinate the activities of the Federal, State, and local authorities and the private sector in the development and implementation of an integrated resource management plan for the recreation area." The 13-member Partnership (12 members appointed by the Secretary of the Interior and 1 by the Secretary of Transportation) is responsible for planning and coordinating the park's management and development (see Current Management section).

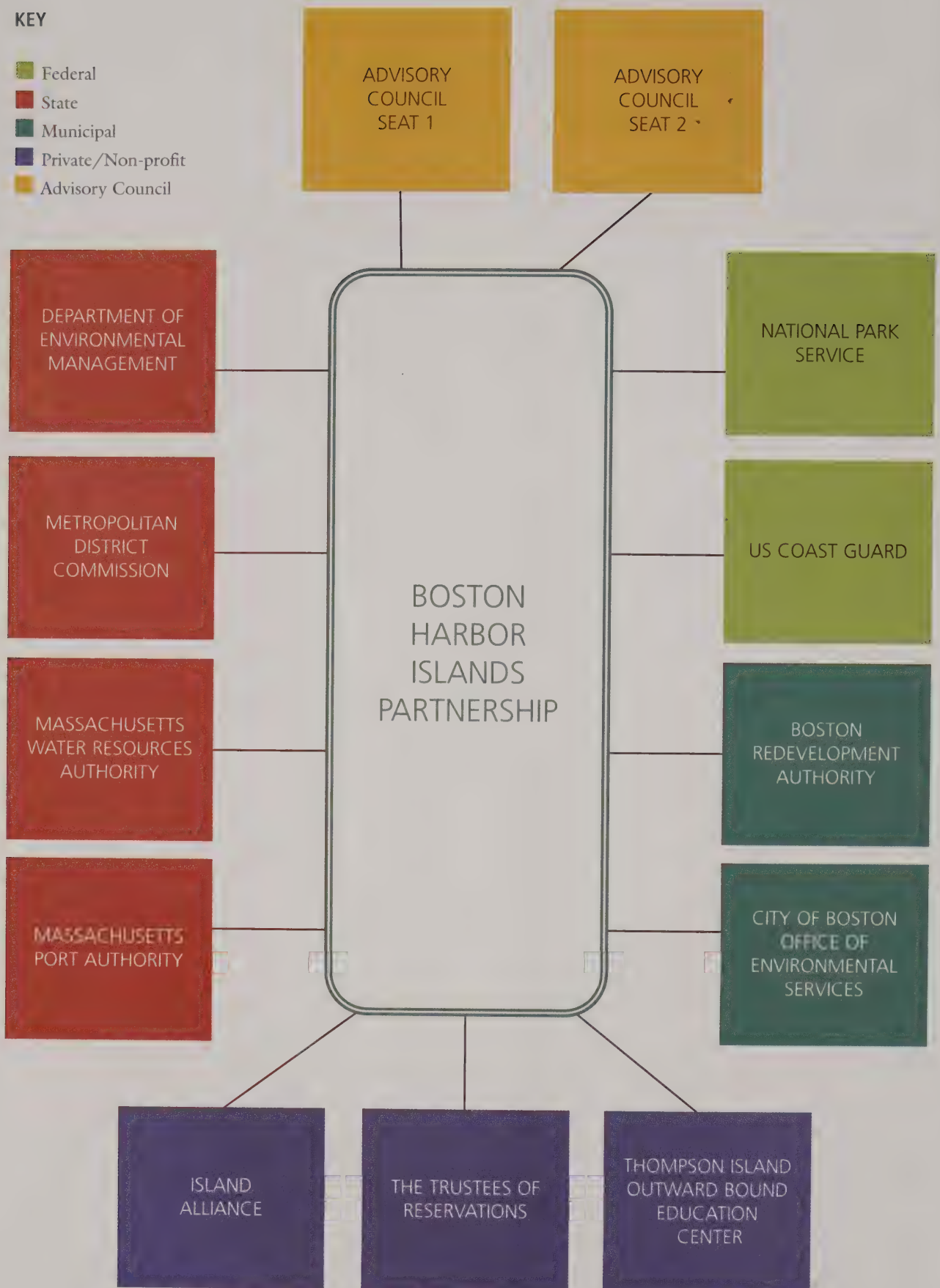
The 1996 federal legislation also established the Boston Harbor Islands Advisory Council, a permanent federal advisory committee with no "sunset clause," whose members are appointed by the director of the National Park Service. The Advisory Council's purpose is to advise the Partnership on the development and implementation of the general management plan. The Council elects two of its members to seats on the Partnership and is mandated to seek advice from concerned citizens and organizations that have an interest in the park. The Council, which currently has 28 members, includes representatives of municipalities; educational and cultural institutions; environmental organizations; business and commercial entities, including those related to transportation, tourism, and the maritime industry; advocacy organizations; Native American interests; and community groups. Another unique aspect of the park is the Island Alliance, a nonprofit group charged with generating private funding for the park. It is the only such organization specifically named in a national park enabling law.

Generally, the 1996 legislation requires that the park is to be administered in cooperation with the private sector, with municipalities surrounding Massachusetts and Cape Cod bays, and with historical, business, cultural, civic, recreational, and tourism organizations.

Public agencies of the Commonwealth operate

KEY

- Federal
- State
- Municipal
- Private/Non-profit
- Advisory Council



under authorities from the Massachusetts legislature. The Massachusetts Environmental Joint Powers Agreement (chapter 491 of the Acts of 1996), which has not yet been employed, permits two or more agencies or jurisdictions to use their authorities, personnel, and resources jointly for an environmental purpose and in any geographic area they may choose. This law allows municipalities and state agencies to work together as well as to work with agencies in adjoining states. Another state law, the Massachusetts recreational use statute (M.G.L. c.21 S 17C) provides strong protection against liability for “an owner of land who permits the public to use such land for recreational purposes without imposing a charge or fee....”

OTHER LEGISLATIVE MANDATES

Closely allied with partnership management is the requirement that federal funding for the park be matched by nonfederal funding. All federal funds that may be appropriated over time to implement the 1996 law may only be expended in a ratio of one federal dollar to at least three dollars from other sources. The nonfederal share may be in the form of cash, services, or in-kind contributions.

In addition to requiring a partnership approach and management in accordance with laws governing the national park system, the 1996 legislation for the Boston Harbor Islands has other specific mandates for managing the national park area. The law incorporates a map showing which islands are included in the park, as well as language permitting the NPS to spend appropriated funds on mainland locations for park infrastructure like piers and information kiosks. However, the law directs that federal funds will not be appropriated for the acquisition of lands, except possibly for a conservation easement or other less-than-fee interest on Thompson Island.

It is explicit in the 1996 law that the right of the Commonwealth of Massachusetts, or any of its political subdivisions, remains unchanged regarding the exercise of civil and criminal jurisdiction or the right to carry out state laws, rules, and regulations within the park.

The legislation also stipulates that the maintenance, operation, improvement, use, and associated flight patterns of Logan International Airport “shall not be deemed to constitute the use of” the park nor “to have a significant effect on natural, scenic, and recreation assets” of the park.

All units of the national park system are required by law to operate in accordance with an approved

general management plan [Public Law 95-625, Section 604(b)]. The 1996 enabling legislation requires that the Boston Harbor Islands Partnership develop and implement a general management plan called, an “integrated resource management plan.” Both legislative mandates are met by this document, which adopts the more common term “general management plan” (see Purpose of the General Management Plan).

Finally, the park’s enabling legislation highlights the importance of understanding the history of Native American use and involvement with the islands, and calls for protecting and preserving Native American burial grounds, particularly those connected with the King Philip’s War. This Congressional recognition of the importance of Indian history and of King Philip’s War has raised public awareness around these topics. It has also resulted in raising park managers’ sensitivity to the complex issues surrounding the management and interpretation of natural and cultural resources associated with American Indian use of the islands. The establishment of the park has brought a new focus for tribes with cultural affiliation to the islands and their resources.

PURPOSE OF THE GENERAL MANAGEMENT PLAN

The purpose of the general management plan is to clearly define the park’s mission and management direction. It provides a foundation to guide and coordinate all subsequent planning and management. The purpose of the plan is also to ensure that this basic foundation for decision making has been developed by the Boston Harbor Islands Partnership in consultation with interested stakeholders and adopted by the National Park Service after adequate analysis of the benefits, environmental impacts, and economic costs of alternative courses of action. It acts as a “contract” between park managers and the public.

All parks within the national park system are required by law to operate under approved general management plans. This ensures that park managers will carry out, as effectively and efficiently as possible, the mission of the National Park Service, which states:

The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The general management plan describes the resource conditions and visitor experiences that should exist at Boston Harbor Islands, and why they should exist. It describes why the park was created, what specific resource conditions and visitor experiences need to be maintained in the park, and what those decisions mean in terms of broad direction for resource management, visitor use, and development of park infrastructure.

The general management plan takes the long view, 15–20 years into the future. The plan considers the park holistically, in its full cultural and ecological contexts: as a unit of the national park system and as a part of Boston Harbor, harbor communities, and the greater metropolitan area.

The plan is a policy-level document that provides guidance for park managers. It is not detailed, specific, or highly technical in nature. As the foundation for all subsequent planning and management, other plans tier off of the general management plan. It provides a consistent framework for coordinating and integrating all the various types of park planning and implementation that are needed.

After the general management plan is adopted, a five-year strategic plan will be developed to lay out goals and management actions needed in the near term. When funds become available to begin the design of facilities or to undertake other specific actions on individual islands that are consistent with the general management plan, then site-specific planning and technical environmental analysis will be done. These more specific undertakings will be subject to federal and state consultation requirements, and the public will be involved throughout the process.

The four basic elements required of NPS general management plans (by Public Law 95-625) are:

- measures for **preservation** of the area's natural and cultural resources
- types and general intensities of **development** associated with public enjoyment and use of the area, including general locations, timing of implementation, and costs
- identification and implementation commitments for visitor **carrying capacities**
- potential **boundary** modifications and the reasons therefor

In addition to the general Park Service planning mandate, the 1996 enabling legislation for the Boston Harbor Islands specifically calls for the development of a plan to help guide the Boston Harbor Islands Partnership in coordinating and prioritizing efforts,

such as improved public access to the islands. The law highlights a number of topics the plan should address:

- a program for coordinated **administration**, with assignment of responsibilities to the appropriate government agency or nonprofit organization
- a **financing plan** for public improvements and services recommended in the plan, including a delineation of profit-sector roles and responsibilities
- a program for coordinating and consolidating agency activities related to **planning and regulation**
- policies and programs to enhance **public outdoor recreation** in the area
- policies and programs to conserve, protect, and maintain the **scenic, historical, cultural, natural, and scientific values** of the islands
- policies and programs to develop **educational opportunities** in the area
- policies and programs to enhance **public access** to the islands
- identification of potential **sources of revenue** from programs or activities in the area
- policies and programs to protect and preserve **American Indian burial grounds** connected with the King Philip's War internment period and other periods
- a policy statement that recognizes **existing economic activities** within the recreation area

CURRENT MANAGEMENT

The Boston Harbor Islands national park area is operated day to day by the agency property owners and managers who work through the Partnership to introduce and maintain consistency parkwide and to create parkwide programs. Several of the member agencies have been managing island properties for many years, and their current management reflects, in some instances, long-standing plans along with new ideas introduced through the new national park area. The Partnership has begun setting the overall policy direction, adhering to National Park Service standards, and Partnership committees have begun serving as coordinators of parkwide functions and information-sharing forums.

The core of this park system is the Boston Harbor Islands State Park. Under state legislation in 1970, the Commonwealth was authorized to acquire islands in Boston Harbor to protect resources and provide recreation. Approximately 150,000 people visit the

state park annually, with a concentration of visitors on summer weekends. The Boston Harbor Islands State Park consists of 16 islands managed jointly by the Department of Environmental Management and the Metropolitan District Commission. Three islands are open and staffed for visitors from May until October during daylight hours, and three are staffed 24 hours a day for campers. Special events are held at other times of the year. (See Visitor Services Chart, page 25.)

The Boston Harbor Islands Partnership, which first convened in June 1997, consists of 13 people representing the following entities: United States of America – National Park Service and U.S. Coast Guard; Commonwealth of Massachusetts – Department of Environmental Management, Metropolitan District Commission, Massachusetts Water Resources Authority, and Massachusetts Port Authority; City of Boston – Office of Environmental Services and Boston Redevelopment Authority; Thompson Island Outward Bound Education Center; The Trustees of Reservations; Island Alliance; and Boston Harbor Islands Advisory Council (2 members).

MEMBERS OF THE PARTNERSHIP

National Park Service (NPS)

The National Park Service provides staff to the Partnership and Advisory Council through a dedicated project office as well as substantial planning assistance from the Boston Support Office. On the mainland, NPS provides parkwide information and orientation, in coordination with the Partnership. It coordinates the operation of visitor contact stations at Long Wharf and the federal courthouse at Fan Pier utilizing staff from NPS, Department of Environmental Management, Metropolitan District Commission, the Island Alliance, and volunteers from the Friends of the Boston Harbor Islands. The Fan Pier facility contains a seasonal information desk, an interactive exhibit, a bookstore, and a small fast-food restaurant. The project office also coordinates the main visitor information telephone line for parkwide activities and an interactive web site. The only NPS land ownership authority is potentially to acquire a conservation easement or other less-than-fee interest on Thompson Island on behalf of the Partnership.

U.S. Coast Guard (USCG)

The United States owns three major lighthouses on islands in the park—Boston Light, Long Island Head Light, and The Graves Light, as well as the navigational marker Nix's Mate and the freestanding Deer Island Light (not in the park) off the tip of Deer

Island. The Coast Guard operates Boston Light Station on Little Brewster Island, which has been legislated to be continued as a staffed lighthouse, the only such remaining station in the United States. Little Brewster is the site of America's first lighthouse (1716) and the second oldest lighthouse tower (1783). The other two lighthouses are completely automated, and the Coast Guard performs routine maintenance on at least a quarterly basis. Long Island Head Light (1819), located on the northeasternmost end of Long Island, offers outstanding views of the main channel into Boston and the northern regions of the park. Access at this time (by reservation only) is by boat or vehicle through the city of Boston's facilities on Long Island, which are not open to the public. The Coast Guard carried out a major repair and rehabilitation on the light within the past two years. The Graves Light, on a small island of bedrock, is inaccessible to the public due to the lack of a large boat mooring, the numerous rock outcroppings, and the range of tide and wave action at the site. In July 1999, the Coast Guard opened Little Brewster Island for limited public access under a pilot program in cooperation with the Island Alliance, U.S. Coast Guard Auxiliary, the Friends of the Boston Harbor Islands, and NPS.

Massachusetts Department of Environmental Management (DEM)

DEM, established as the Department of Natural Resources in 1897, is the agency that operates the state's forests and parks system. It manages 13 islands in the Boston Harbor Islands State Park: Bumpkin, Gallop's, Grape, Great Brewster, Middle Brewster, Outer Brewster, Calf, Little Calf, Green, Hangman, Raccoon, Slate, and Sheep. It also manages Spectacle Island (see map, page 24 and Appendix 11) jointly with the city of Boston. Spectacle, scheduled to be opened in 2002, is being developed as a park capped with material from the Boston highway and tunnel project. Its history included a number of socially inhospitable uses, including, until 1959, the city's landfill. Islands that are developed for visitors are Bumpkin, Gallop's, and Grape; together they receive approximately 23,000 visitors per year. In past years, Great Brewster and Calf islands had piers and water shuttle service. DEM expects to construct a new pier on Great Brewster to open the island again to the public. Public access to Calf Island will occur on a controlled basis. Currently these islands are accessible by small craft, i.e. private boaters. Headquarters for the state park are adjacent to the ferry terminal at

Hingham, where DEM also maintains an information board at Hewitt's Cove.

Metropolitan District Commission (MDC)

MDC, which was established as the Metropolitan Parks Commission in 1893, operates a 20,000-acre park system throughout the 36 cities and towns of metropolitan Boston. In Boston Harbor, it manages three islands of the state park: George's, Lovell's, and Peddock's. (See maps, pages 21, 23.) George's, the island hub for the ferry system, receives the great majority of island visitors—approximately 100,000 annually.

Visitors come to explore Fort Warren, the Civil War era fort that has been partially restored, or to enjoy the grounds around the fort for picnics. Lovell's, which features a lifeguarded beach and Fort Standish, a turn-of-the-century-era fortification, receives about 13,000 visitors. Peddock's, the second largest harbor island, contains more than 20 buildings that remain of Fort Andrews, built in 1900 (see Appendix 12). It also has approximately 40 summer cottages which are gradually being vacated and removed, campsites, wetlands, and beaches. A new pier is expected to support a great increase in visitors, which in the past numbered approximately 25,000 annually.

Massachusetts Water Resources Authority (MWRA)

MWRA was created in 1985 to carry out the "Boston Harbor Project" by building and operating new wastewater treatment facilities and eliminating the discharge of sewage into the harbor. MWRA owns and operates two facilities within the park: Deer Island Wastewater Treatment Plant and Nut Island Headworks. Both facilities are actually on what have become mainland peninsulas accessible by foot, bicycle, and vehicle, but each has a large pier, that will be used as the primary visitor access point to Deer and Nut islands when construction has been completed and the islands have been opened routinely for visitors. At Deer Island (see map page 20), two-thirds of the island's 210 acres are taken up by the wastewater treatment plant, which serves 43 communities with a total population of 2.5 million. MWRA provides guided tours of its facilities, including an historic pump house, from April to October; its perimeter walkway, with excellent views to other islands, has been open for recreational visitors for two years. On Nut Island a 14-acre park of walking paths and views of Quincy and Hingham Bays opened in fall 1999. MWRA continually monitors the quality of water in Boston Harbor.

Massachusetts Port Authority (MassPort)

Operating Logan International Airport and a number of key maritime industrial facilities in the port are the Authority's primary missions. In addition to Logan, MassPort owns nearly 600 acres along the Boston waterfront, including maritime industrial facilities in South Boston (Conley Container Terminal, Black Falcon Cruise Terminal, and the North Jetty) and in Charlestown (Boston Autoport and Medford Street Terminal). MassPort owns, operates, and/or leases a number of other noteworthy waterfront properties: the Boston Fish Pier, the World Trade Center, and significant additional development property in South Boston; the East Boston Piers (including Piers Park); and Constitution Plaza at Hoosac Pier in Charlestown. While MassPort does not directly own or operate any of the Boston Harbor Islands, several of its properties, particularly those near the future Boston Convention and Exhibition Center in South Boston and the East Boston Piers, are potential locations for water transportation and visitor facilities that could provide connections to the islands in the future.

City of Boston

The City of Boston owns Long (see map, page 22), Moon, and Rainsford islands, and part of Spectacle Island. Long and Moon islands are not open for public recreational use, but instead are used for social services at a campus on Long Island, and a police firing range and fire-fighting training on Moon Island. The city plans to continue these uses in the foreseeable future, as no mainland sites to which these functions could be located are expected to be identified. However, discussions have begun about opening portions of Long Island to limited public access by water. In recent years, several programs, such as a native plant nursery (by the Friends of the Boston Harbor Islands), a two-week summer day camp (with the New England Aquarium), and a Boston Parks Department fishing contest, have allowed limited public access. Rainsford Island is accessible only by private watercraft and has no visitor facilities or services.

Boston Redevelopment Authority (BRA)

Boston Redevelopment Authority is the City of Boston's planning, economic, and industrial development agency. One of BRA's planning functions is to oversee planning and permit development along Boston waterfront. The Authority initiated the Harborwalk program which, when complete, will provide a 43-mile pedestrian walkway along the waterfront ensuring that the public has access to the

water's edge. It owns the Boston Marine Industrial Park, and owns and manages Long Wharf in downtown Boston. The north side of Long Wharf currently contains a marina and docking facility for water shuttles and commuter boats. The south side of the wharf contains a ticket booth and docking facilities for excursion vessels and the Boston Harbor Islands ferry terminal. BRA plans to rebuild a wharf (at the site of historic T Wharf) next to Long Wharf with new docks and pier infrastructure to serve as the permanent main downtown terminal for the harbor islands ferry system.

Thompson Island Outward Bound Education Center (TIOBEC)

Since the early 1800s, Thompson Island has served as a home of educational institutions, making it the oldest continuously operating educational site in the city. The experiential education tradition started with the Boston Farm and Trade School (1832–1955) where young men lived on the island, attended classes, farmed, and practiced various trades. Thompson Island today is owned and managed by a private nonprofit educational institution which incorporates Outward Bound principles of respect for self, empathy for others, responsibility to community, and stewardship of the environment. In addition to operating a private middle school for boys from metropolitan Boston, this nonprofit organization offers school-year and summer programs for Boston public schools. Currently the Thompson Island Outward Bound Education Center raises \$2 million for scholarships. To promote visitation and to generate revenue for island programs, the Center offers Outward Bound programs for area organizations, and seasonal outings, events, and conferences. The public has access to Thompson Island during the summer on Saturdays through tours by the Friends of the Boston Harbor Islands. Annual visitation, which is largely school groups, totals 26,000.

The Trustees of Reservations (The Trustees)

The Trustees is a nonprofit, member-supported conservation organization which owns and manages World's End for public recreational uses, such as walking, bicycling, horseback riding, fishing, picnicking, and cross-country skiing. World's End is a mainland peninsula and can be reached by foot, bicycle, and vehicle. An entrance fee is charged, and the reservation is open every day of the year. Annually, it receives approximately 60,000 visitors. The Trustees owns and operates 82 reservations throughout the state totaling some 21,000 acres. The Trustees is considering the feasibility of building a pier for water access.

Island Alliance

The Island Alliance was established in 1996 solely to provide financial support to the Boston Harbor Islands national park area. It works to attract investment and support for the park from the private sector, coordinating outside activities to provide necessary strategic and financial resources. It assists directly with the support of mainland facilities, such as the visitor contact station at Fan Pier which includes a retail outlet and food service.

Advisory Council

The Advisory Council has 28 members appointed by the director of the National Park Service to represent seven distinct interest groups: municipalities; educational and cultural institutions; environmental organizations; business and commercial entities; advocacy organizations; Native American interests; and community groups. The Council's role is to advise the Partnership in the planning and operation of the park through public involvement, and it has helped facilitate the public process in connection with this draft general management plan. It has two seats on the Partnership. It operates subject to the provisions of the Federal Advisory Committee Act.

RESOURCE PROTECTION

Natural and cultural resources and values require ongoing stewardship to leave them unimpaired while providing current and future generations with the opportunity to enjoy and benefit from them. DEM and MDC manage the state park islands in accordance with federal, state, and municipal laws and regulations, including those overseen by the Massachusetts Historical Commission, the Massachusetts Department of Environmental Protection, Coastal Zone Management, Natural Heritage Program, and local conservation commissions.

DEM, MDC, and the city of Boston have staff archeologists and cultural and natural resource specialists who provide technical assistance and staff training. These staff, along with planning and engineering staff, monitor the islands to assess needed improvements or management actions. During the summer season, six islands are staffed 24 hours a day to protect island resources and to provide visitor services. The islands are maintained principally by seasonal staff. (See Visitor Services chart, page 25.)

Managing agencies use various methods for determining the efficacy of development in light of resource protection. On Thompson Island, for example, no facilities may be built outside the central campus area. In general, resources are monitored, and planning is conducted before developmental changes

occur. The Town of Hingham owns and manages Langlee, Sarah, Ragged, and Button islands in Hingham Harbor as conservation land. These islands have been kept in their natural condition for passive recreational use, without facilities, services, or educational programs. The public accesses these islands by small private watercraft.

The intensity of resource protection varies depending on financial resources available to the agency. Some activities carried out by managers are: prohibiting access to fragile shoreline bluffs, signing and mulching designated trails to keep pedestrians away from vegetation, promoting environmental stewardship by direct and indirect educational techniques, horticultural maintenance of cultural landscapes, repair and stabilization of historic buildings.

Administrative Carrying Capacities

Some island managers have established an administrative carrying capacity for individual islands. The 1986 Boston Harbor Islands State Park Master Plan provided the most recent analysis of carrying-capacity criteria based on the combination of visitors' experience and an analysis of resource protection. Where they exist, carrying capacities were not scientifically determined and have not been applied throughout the island system. In the case of George's Island, for example, a limit of 5,000 visitors at a time for events has been established by MDC based on a combination of factors concerning impacts on resources, visitor safety, staffing levels, and management judgment.

RESEARCH AND INFORMATION

Research is conducted primarily by private and public institutions. Examples of research include long-term studies in archeology by professors at the University of Massachusetts, Northeastern University, and Boston University; various marine environmental research conducted by the Urban Harbors Institute of the University of Massachusetts at Boston; marine biotechnology, coastal management, nonindigenous species, ocean observation and modelling at Massachusetts Institute of Technology Sea Grant Program; marine environments at New England Aquarium; water quality by National Oceanic and Atmospheric Administration (NOAA); and bathymetry of the harbor by the U.S. Geological Survey at Woods Hole Oceanographic Institute. MWRA monitors the harbor's marine environment, including diversity of bottom-dwelling animal communities and sampling for disease and contaminants in fauna and flora. Important

repositories of information about the islands include the Massachusetts State Archives, national register documents at the Massachusetts Historical Commission, and the Metropolitan District Commission's extensive archives and photograph collections.

VISITOR ACCESS, USE, AND ENJOYMENT

At this time, seven islands or peninsulas are staffed to serve park visitors: George's, Lovell's, Gallop's, Bumpkin, Grape, and Peddock's islands; and World's End peninsula. Passenger ferry service is available to George's, the hub island, from which water shuttle service is provided to the other five staffed islands. Other islands — Thompson, Deer, Nut, and Little Brewster — host visitors according to a schedule that depends on staff availability and scheduled boat excursions. (See Visitor Services chart, page 25.)

The overwhelming majority of ferry passengers remains at George's Island, which has a small visitor contact station, a concession snack bar, interpretive signs, and ranger-led tours of Fort Warren. Peddock's contains a small visitor contact facility in a former military guard house. Of the eight islands and peninsulas routinely open for park visitors, only George's has potable water (though not consistently reliable), along with a generator for electricity to run equipment and serve the resident island staff. All islands managed for visitors have toilets (mostly composting). All the staffed islands offer piers, picnic areas, trails, and guided interpretive walks. During the summer season, DEM and MDC have island managers who stay overnight on the islands.

When Spectacle opens in 2002, it will have a handicapped-accessible pier; a small day-use marina; two beaches; five miles of trails; and a visitor information center of approximately 7,500 square feet including a cafe, exhibits, a souvenir shop, staff living areas, and space for programs, lectures, and films (See Appendix 11). The island will be managed by a public-private partnership which has been contracted to operate island services.

A total of approximately 60 campsites are available on Lovell's, Peddock's, Bumpkin, and Grape for use under a reservation system. The campsites on the DEM islands (Bumpkin and Grape) are available through a computerized statewide system of reservations, whereas those on the MDC islands are reserved directly by phone with MDC.

Several tours of Boston Light by reservation have been offered by the Friends of the Boston Harbor

Islands each summer since 1986. In 1999 the Coast Guard established a pilot program with the Island Alliance and the National Park Service to bring interpretive excursions to Boston Light on a more frequent basis. Excursion visitors, together with visitors in groups that currently come by small craft, total approximately 1,000 per year.

Transportation

From early May to mid-October, a passenger-ferry company under contract to the state provides service for the public to George's Island from three mainland points: downtown Boston, Hingham on the south shore, and Lynn on the north shore. George's is the long-standing transportation hub of the island system. The round-trip fare is \$8 for an adult and includes free water shuttle service among George's, Bumpkin, Gallop's, Grape, Lovell's, and Peddock's islands. Vessels used for ferries hold 350 to 500 passengers, whereas water-shuttle vessel sizes range from 49 to 150 passengers.

More than 80 percent of ferry passengers leave from Long Wharf in downtown Boston, where the Boston Redevelopment Authority leases space to boat operators (the balance leave from Hingham and Lynn). An undetermined percentage of island visitors, with estimates up to 50 percent, arrive by private boat and tie up at piers, or anchor offshore, or haul their craft onto beaches. Hewitt's Cove in Hingham is a transportation node not only for island service but also for commuter boat service between the south shore and Boston. DEM has its state park headquarters in a former shipyard building there. A pier at Lynn Heritage State Park, operated by DEM, provides the current embarkation point from the north shore, running one round-trip ferry per weekend day during the summer season.

Access for disabled people, which is not universally available throughout the system, is a provision made especially difficult by the steep grade changes that occur on boarding vessels in the 9½-foot tide of Boston Harbor. Neither boats nor piers are fully handicapped accessible, although piers at Peddock's, Spectacle, and Deer will be. DEM is designing improvements at Gallop's Island.

Over the years of state park operations, several transportation systems have been tried. Currently, a sole operator is under contract to DEM and MDC to provide passenger service from the three mainland points and to provide free inter-island water shuttle service. In the 1980s, a state subsidy (no longer

available) supported the water shuttle, and multiple private boat operators established services from a number of points on the mainland while state park managers coordinated docking among them.

For the immediate future, from 2000 to 2001, the state will be issuing a new contract with the potential for adding mainland departure points. The opening of Spectacle Island in 2002 will add another hub to the water transportation system. Additional islands to be connected potentially to the ferry system with the opening of Spectacle include Deer and Thompson, with the possibility of adding mainland departure points from the north and south shores.

Road access is the only means available to World's End at this time, although a pier for water access is contemplated by The Trustees. Other islands accessible by road are Deer, Nut, Moon, and Long, although policies by the owners of those islands discourage park visitors from using automobiles out of concern for traffic through adjacent neighborhoods.

EDUCATION AND INTERPRETATION

Seasonal programs for visitors include daily ranger-led fort and island nature tours. DEM interpreters hold scheduled events ranging from their Wild Walks, which explore the islands' natural beauty, to "Kidleidoscope," a nature-oriented program for children four to eight years old throughout the summer. MDC schedules a variety of events including "Mysteries of the Fort," which explores Fort Warren on George's Island, and "Mothers, Daughters, Sisters—Women at Fort Warren," which explores the role of women at Fort Warren in times of war and peace. MDC also has a Harbor Defense Weekend, where rangers interpret the role of the harbor forts in wartime as well as programming on pirates and archeology in the harbor. Other MDC events include a Civil War encampment, a children's fest, a Halloween event, and with the Island Alliance, an opening day concert.

School programs at the state park islands are operated by the agencies in April, May, and June, with classes reserving time mostly on George's, but also occasional programs at Bumpkin, Gallop's, Grape, Lovell's, and World's End. Also available is the *EnviroLab II*, a private scientific vessel which runs two programs a day for school groups from a pier at the University of Massachusetts, Boston.

The Willauer School, a private middle school for urban boys, operates on Thompson Island through the

school year, serving day students and boarders. Outward Bound, nationally known sea- and land-based expeditions for youth, offered in the summer, are geared to experiential learning and personal growth, challenging participants to go beyond their perceived limits, make responsible choices, and work in concert with others.

Other nature, historic, and recreational programs occur throughout the year, and primarily in summer. The city of Boston and the New England Aquarium, in a pilot program, operated a summer camp on Long Island which introduced youth to the islands' history and habitats. Visitors could also tour a working United States Coast Guard lighthouse at Little Brewster Island, and a working wastewater sewage facility on Deer Island. Ongoing activities include concerts, historic reenactments, boating, swimming, sunset cruises, and lighthouse cruises. The Harbor School in Dorchester, along with the Island Alliance, is developing a middle school curriculum which uses the harbor and the harbor islands as the basis for its science and historical studies. Programs on World's End take place throughout the year and include bird walks, geology explorations, a summer solstice celebration, a butterfly walk, and tree identification walks.

Many educational programs are offered on the harbor by organizations that work closely with the Partnership, such as the New England Aquarium and the Hull Lifesaving Museum. The "Harbor Visions Crew," a collaborative project of several organizations, trains 15 to 20 youths each summer to conduct outreach programs to their peers with a curriculum related to the Boston Harbor environment. And, the Boston Harbor Association works with MWRA to educate students about the Deer Island treatment facility.

MANAGEMENT AND OPERATIONS

Staffing

Full-time permanent staff for park administration, visitor services, and resource protection are employed by NPS, the U.S. Coast Guard, DEM, MDC, Thompson Island, The Trustees, and the Island Alliance, and seasonal staff is added by most of these agencies. The approximate number of full-time equivalent park staff employed directly in operations and visitor services for the Boston Harbor Islands is NPS – 4, Coast Guard – 4, DEM – 6, MDC – 10, Thompson Island – 15, The Trustees – 1.5, Island Alliance – 2, for a total of approximately 45 full-time equivalent personnel. Seasonal employees add approximately 32 full-time equivalent staff.

DEM, MDC, Thompson Island, MWRA, and The Trustees maintain heavy equipment for managing their properties. Most organizations maintain boats for transporting their employees and MDC has two landing craft for transport of vehicles and equipment and beaching on islands without piers.

Public Safety

Public safety is handled by many entities: Massachusetts State Police, Massachusetts Environmental Police, agencies that manage islands, municipalities, harbor masters, and the U.S. Coast Guard. While there is no central coordinator, the Partnership committee on public safety has furthered coordination and communications among the nine island owners, ten law enforcement jurisdictions, and three counties, resulting in less duplication of effort.

The Coast Guard has two main centers of operation within the harbor. One is the Group Boston command, the headquarters for the Coast Guard's marine safety office and large Integrated Support Command, located on the Boston waterfront just north of Battery Wharf. Large ships moor here along with aids-to-navigation vessels. The other is a multi-mission station in Hull at Point Allerton, where small vessels are maintained. In the harbor, the Coast Guard is responsible for oil spill response, navigation and marine traffic management, recreational boating safety, search and rescue, and enforcement of all laws and treaties on waters subject to federal jurisdiction.

Costs and Financing

The BHI Partnership is developing a system to account for appropriate park expenditures, in keeping with the law's requirement of a three-to-one nonfederal-to-federal funding match for the park. It has held discussions about a number of approaches, including a funding pool.

Although the Partnership does not have its own budget, there are costs associated with maintaining it, borne mostly by the NPS project office acting as staff to the Partnership.

Some members of the Partnership can identify all expenditures associated with the Boston Harbor Islands national park area and some cannot. For instance, the Commonwealth funds DEM and MDC without a breakdown for the Boston Harbor Islands park because each state agency is responsible for and funds properties outside of the island system, making it difficult to identify precise funds for this park. Park accounting systems are also complicated by different fiscal years (the state fiscal year begins July 1, whereas

the federal fiscal year begins October 1, and the not-for-profit agencies have other fiscal years). Typically, state funds for each summer season are not certain to be available to DEM and MDC until the budget is passed in the late spring or summer, making it difficult to hire seasonal staff with enough advance time to prepare for a full season.

It is estimated that the current annual operating cost for the Boston Harbor Islands national park area is approximately \$4 million.

Boundary and Land Protection

Federal and state laws and policies address the subjects of the park boundary location and requirements for land protection. The park boundary includes the areas shown on the official map, referred to in the law (see map, following page v), as well as landside points that may be “required for access, visitor services, and administration of the park.”

The landside points specifically mentioned in the law are: in the city of Boston at Long Wharf, Fan Pier, Old Northern Avenue Bridge, the Custom House, John F. Kennedy Library, Charlestown Navy Yard, and other places on Harborwalk (a walkway along the water’s edge); in the city of Quincy at Squantum Point, Marina Bay, the Fore River Shipyard, and Town River; in the Town of Hingham at Hewitt’s Cove; the Town of Hull; in the city of Salem at Salem National Historic Site; and in the city of Lynn at the Heritage State Park. Inclusion in the boundary allows the expenditure of federal funds for park-related activities at those locales.

The extent of the island land area is taken to be the mean low water mark unless otherwise specified in the deed for a particular property. The law’s reference to “lands and waters that comprise [the national park area]” refers to “waters” occurring within the land areas, such as ponds or streams, rather than the waters of Boston Harbor.

The park’s enabling legislation leaves jurisdiction over harbor waters unaffected by the park and retains it in the purview of several agencies including: for the state, the Department of Environmental Protection; Executive Office of Environmental Affairs; Department of Environmental Management; Division of Fisheries, Wildlife, and Environmental Law Enforcement; State Police; Massachusetts Historical Commission; and Massachusetts Coastal Zone Management; for the federal government, the Army Corps of Engineers and the Coast Guard; and for local municipalities, conservation commissions, water and sewer authorities, and specifically for Boston, the Boston Redevelopment Authority.

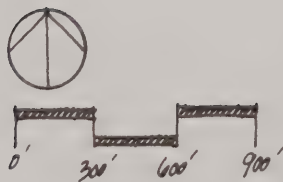
Another feature of the law establishing this national park area is that land would not be owned by the National Park Service except potentially for a conservation easement or other less-than-fee interest on Thompson Island.

EXTERNAL COOPERATION

The park is connected to several municipalities on the harbor rim and has maintained important relationships with them. Although only World’s End is fully open to park visitors at this time, others that will open in the future, such as Deer and Nut islands, have agreed to encourage water rather than road access and thus lessen traffic impacts to neighborhoods. DEM, which has a long-term presence at Hewitt’s Cove, where a large-scale mixed residential and commercial development is proposed, is working closely with the community on the planning.

In addition to municipalities the Partnership maintains important relationships with many non-government and government entities. These include the Friends of the Boston Harbor Islands, Save the Harbor/Save the Bay, The Boston Harbor Association, Hull Lifesaving Museum, New England Aquarium, U.S. First District Court, Environmental Diversity Forum, Roxbury Multi-Service Center, Urban Harbors Institute at the University of Massachusetts, Massachusetts Marine Educators, the Metropolitan Area Planning Council, the Greater Boston Chamber of Commerce, and many others.

DEER ISLAND
Existing Conditions



GEORGE'S ISLAND Existing Conditions



LONG ISLAND

Existing Conditions



PEDDOCK'S ISLAND
Existing Conditions



SPECTACLE ISLAND

Existing Conditions

Intertidal Zone

North Drumlin

Seawall

Paths

Granite Pilings

Beach

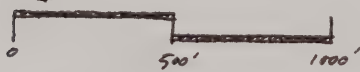
South Drumlin

Visitor Center
(to be constructed 2001)

Pier

Promenade

Beach



CURRENT VISITOR SERVICES

Island	Acres*	Manager	Staffed (Intermittent)	Guided Tours	Lifeguard	Visitor Station	Drinking Water	Refreshments	Toilet Facilities	Picnic Areas	Hiking Paths	Camp Sites	Historic Structures	Passenger Ferry	Water Shuttle	Boat Slips	Vehicle Access	Open by Arrangement
Bumpkin Island	32.7	DEM	X	X		X			X	X	X	X	X		X			
Button Island	1.0	Town of Hingham									X							
Calf Island	22.4	DEM									X		X					
Deer Island	203.5	MWRA	**	X		X	X		X		X		X				X	X
Gallop's Island	26.9	DEM	X	X		X			X	X	X		X		X			
George's Island	41.3	MDC	X	X		X	X	X	X	X	X		X	X	X	X		
Grape Island	53.7	DEM	X	X		X			X	X	X	X	X		X			
The Graves	1.8	U.S. Coast Guard											X					
Great Brewster	23.9	DEM									X		X					
Green Island	1.7	DEM																
Hangman Island	0.3	DEM																
Langlee Island	5.2	Town of Hingham																
Little Brewster Island	3.1	U.S. Coast Guard	**	X									X					X
Little Calf Island	0.8	DEM																
Long Island	225.2	City of Boston											X					
Lovell's Island	51.9	MDC	X	X	X	X			X	X	X	X	X		X			
Middle Brewster Island	13.6	DEM											X					
Moon Island	45.7	City of Boston											X					
Nut Island	14.0	MWRA	**	X							X						X	X
Outer Brewster Island	20.1	DEM											X					
Peddock's Island	210.4	MDC	X	X		X			X	X	X	X	X	X	X			
Raccoon Island	3.6	DEM																
Ragged Island	4.1	Town of Hingham									X							
Rainsford Island	21.6	City of Boston											X					
Sarah Island	4.6	Town of Hingham																
Sheep Island	3.2	DEM																
Slate Island	12.7	DEM																
Spectacle Island (when open in 2002)	105.0	DEM & City of Boston	X	X	X	X	X	X	X	X	X			X	X	X		
Thompson Island	169.9	Thompson Is. Outward Bound	**	X			X		X	X	X		X	X				X
World's End	274.3	The Trustees of Reservations	X			X			X		X						X	

* Acreage derived from measurements in GIS by Environmental Data Center, University of Rhode Island ** Full-time Staff

M I S S I O N A N D T H E M E S

The foundation of the general management plan rests on the park mission, a short narrative that reflects the park's purpose and significance. The mission provides a common ground for park management based on the 1996 enabling legislation. It describes the management philosophy for the park and what the park is to be like in the future.

Park purpose and significance statements support the mission statement. The purpose states why the park was established as a unit of the national park system. Park significance defines the park's place within the broader regional and national context. Park themes flow out of these statements and incorporate key concepts that characterize the Boston Harbor Islands national park area. Their function is to communicate the park's purpose and significance to the public.

PARK MISSION

The mission of the Boston Harbor Islands, a national park area, is to make the island system an integral part of the life of the surrounding communities and region, and to protect the islands as a resource of national significance, while improving public knowledge and access for education, recreation, and restful solitude within an urban area.

The purpose of Boston Harbor Islands, a national park area is:

- to preserve and protect a drumlin island system within Boston Harbor, along with associated natural, cultural, and historic resources
- to tell the islands' individual stories and to enhance public understanding and appreciation of the island system as a whole, including the history of American Indian use and involvement
- to provide public access, where appropriate, to the islands and surrounding waters for the education, enjoyment, and scientific and scholarly research of this and future generations

By their configuration, assemblage of natural, geologic, cultural, and historic features, and proximity to a major metropolitan area, the Boston Harbor Islands collectively offer outstanding opportunities for public use and enjoyment. The primary significance of the park's resources resides in:

- islands and peninsulas composed of 1,600 acres of land, archeological resources, historic sites, open space, wildlife habitats, and 35 miles of relatively undeveloped shoreline; all inside an

area of 50 square miles and set against the skyline of Boston and other harbor communities

- the only drumlin field in the United States that intersects a coast, formed by the glaciers some 15,000 years ago
- opportunities for solitude and personal renewal, and land- and water-based education and recreation within an urban area with potential to serve visitors from around the nation.

Contributing to the significance of the park are:

- archeological resources dating from thousands of years of occupation of the islands by American Indians
- three National Historic Landmarks—Boston Light, Fort Warren, and Long Wharf—and other historic sites and landscapes resulting from Euro-American use
- complex natural communities adapted to coastal and island life
- social service facilities and urban infrastructure (water and sewer) that are an integral part of the surrounding communities as well as the history of the region

PARK THEMES

Park themes communicate the national significance of the Boston Harbor Islands. They express key concepts that characterize the island system. The holistic approach of the themes helps to break down the rigid lines often perceived between past and present, and between people and their environment. The themes are conceptual, rather than a simple listing of important topics or a chronology of events. More specific statements that deal with individual islands or more detailed ideas may be elaborated from the park themes for education, interpretation, and resource management as programs are developed. Examples of sub-themes are presented below to illustrate the concepts.



Islands on the Edge

ISLANDS ON THE EDGE

Figuratively, the Boston Harbor Islands have often been on the “edge” of society; places used to isolate people, institutions, and activities. Since their ancient formation by rising sea level, the islands have literally been on the edge of the continent, places where land meets sea. Today the islands are at the edge of a major city.

Sub-Theme Examples

- Starting in 1675 the Massachusetts Bay Colony turned Deer Island, and other islands, into internment camps for American Indians during King Philip’s War. This was one of a number of government-sanctioned hostilities toward native peoples in their homeland.
- Captives of several other conflicts have been imprisoned on the islands: Confederate officers were held by the Union during the Civil War; World War II brought Italian POWs, prisoners of the United States.
- The islands have been intensively used to address serious issues of urban life. Island hospitals, quarantine stations, asylums, reform schools, and prisons are among the institutional uses that manifest the reform theory of isolating social and public health problems from the mainstream of everyday life.
- Facilities necessary for urban life, such as garbage dumps and wastewater treatment plants, have been removed from heavily populated areas and located on the islands. Some of those facilities were innovations in their day; today wastewater facilities on the harbor are on the cutting “edge” of technology.
- The drumlin field that intersects the coast in eastern Massachusetts, and results in the drowned drumlins that makes up many of the Boston Harbor Islands, is a coastal geological formation rare in the United States.
- Land and water meet at the Boston Harbor Islands, giving rise to a relatively natural island environment on the edge of a major urban area. The island park is composed of 1,600 acres including open space, wildlife habitats, and 35 miles of shoreline, within view of downtown Boston and other harbor communities.
- The proximity of a major metropolitan area allows children and families from diverse communities, many without resources to travel to other national parks, the opportunity to visit the relatively natural and culturally rich islands.

- The edge between land and sea has changed over time, both through dynamic geological processes and through human action, such as the filling of Boston’s waterfront.



Home in the Harbor

HOME IN THE HARBOR

The islands and the surrounding estuary have been home to a rich diversity of plant and animal life for millennia. People have lived on and around the Boston Harbor Islands for thousands of years and have made a mark on the landscape.

Sub-Theme Examples

- American Indians used the Boston Harbor Islands for at least 8,000 years, living according to traditional ways.
- The Boston Basin and its drainage system, with its abundance of life, is the reason people settled here. The protection of the estuary and the land surrounding it from pollution is a major challenge of the developed urban areas of the region.
- Europeans settled on the islands in the 1600s, beginning a long line of island residents that have included farmers, fishermen, lightkeepers, military families, and others who depended on the islands for their livelihoods.
- Surrounding harbor communities and their residents have had intimate interactions with the Boston Harbor Islands and their residents, and the islands remain an integral part of life on the harbor, including their role as departure points for visitors to the islands.
- Diverse cultural and historic resources attest to the long history of use, from prehistoric archeological sites to historic structures that housed island residents.
- Terrestrial, intertidal, and marine life abound on and around the islands. Breeding populations rely on island-related habitats, and migrating populations find hospitable shelter here. After thousands of years of human habitation, much of the plant and animal life is not native to the islands.

PORTAL TO NEW ENGLAND

Marking the maritime entry to New England, the Boston Harbor Islands have played an important role in European exploration, and subsequent navigation, commerce, and coastal defense.

Sub-Theme Examples.

- European newcomers exploring this part of North America found Boston Harbor a hospitable haven and an important portal to the wealth of the “new world.”
- Maritime commerce through Boston Harbor was the lifeblood of early New England, and now, some 300 years later, it continues to be a vital economic activity for the region.
- The challenge of navigating through the islands led to the construction of numerous navigational aids, including the country’s first lighthouse.
- The islands have a long history as the location of strategic coastal defenses and are dotted with the remains of fortifications. The islands were seen as perfect locations from which to protect citizens from foreign attack and to allow the peaceful pursuit of business and pleasure.



Portal to New England

RENEWAL AND RECONNECTION

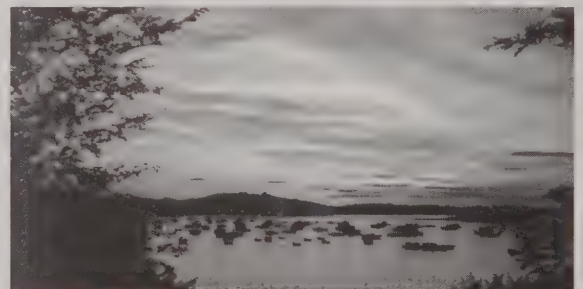
Boston Harbor and its islands provided a rich and sustaining environment for human life until people’s everyday connection to the harbor was severed by intensive urban and industrial use and by pollution. Now, with the cleanup of Boston Harbor, natural ecosystems have the opportunity to renew themselves, and people are rediscovering the harbor as a setting for personal renewal and solitude.

Sub-Theme Examples

- Now that improvements to the region’s wastewater treatment have been implemented through the 10-year Boston Harbor Project, the quality of Boston Harbor waters and the

surrounding natural environment should continue to improve, given that significant pollution sources are being addressed with additional programs.

- One response to the cleaner harbor is reconnection by residents of metropolitan Boston to the waterfront and the islands, aided by a wide variety of organizations and individuals. As part of that reconnection, the Boston Harbor Islands have been added to the national park system under a unique cooperative management system.
- Park managers and visitors have the opportunity to participate in the renewal of the natural environment of the islands through careful stewardship, “green” infrastructure development, and scientifically based natural resource restoration programs.
- American Indians have been working to maintain and regain their cultural heritage, and the Boston Harbor Islands play a key role in this process. The islands, and their management, provide opportunities for increased awareness between Native and non-Native communities.
- During the 1800s and early 1900s the Boston Harbor Islands were places for people to seek relaxation and personal renewal through solitude, experiences in nature, and recreational and cultural activity; today these opportunities are once again increasing.



Renewal and Reconnection

G O A L S A N D P O L I C I E S

This chapter is organized around six mission goals for the park. Each goal addresses a broad subject for park management:

- resource protection
- research and information
- visitor access, use, and enjoyment
- education and interpretation
- management and operations
- external cooperation

OVERVIEW

Goals express the essence of the park's mission and articulate the ideals that the Boston Harbor Islands Partnership is striving to attain in perpetuity. While they are not quantifiable, they do provide the basis for quantifiable long-term goals that are developed in the park's five-year strategic plan. In short, the goals assert the ideals that the harbor islands are protected; that park visitors are satisfied and knowledgeable; and that the Partnership is effective. Following are six mission goals for the Boston Harbor Islands:

Resource Protection: *The Boston Harbor Islands as a whole, containing natural, geologic, cultural, and historic resources and associated values, are protected, preserved or restored, and managed within their broader marine and coastal ecosystem and their cultural context.*

Research and Information: *The Boston Harbor Islands Partnership contributes to knowledge about the island system; management decisions about natural, geologic, cultural, and historic resources and visitors are based on adequate scholarly and scientific information.*

Visitor Use, Access, and Enjoyment: *An expanded base of visitors enjoys and is satisfied with the facilities, services, commercial operations and recreational opportunities offered on the Boston Harbor Islands and at associated mainland sites. The attributes of these offerings include their availability, accessibility, diversity, quality, and safety.*

Education and Interpretation: *Park visitors and the general public understand and appreciate the resources and values of the island system, through the park themes: Islands on the Edge, Home in the Harbor, Portal to New England, and Renewal and Reconnection.*

Management and Operations: *Each member of the Boston Harbor Islands Partnership is committed to the*

funding, operation, and development of the park using best management practices, systems, and technologies to accomplish the park's mission.

External Cooperation: *Park management is coordinated by the Boston Harbor Islands Partnership in cooperation with Indian tribes and historical, business, cultural, civic, environmental, recreational, and tourism organizations. Cooperators and individuals support the park mission through contributions and creative initiatives.*

The federal enabling legislation for the park requires that the island system be administered in accordance with laws applicable to the national park system; the most important in providing general direction to managers are the provisions of the NPS Organic Act of 1916,¹ and the NPS General Authorities Act of 1970. The goals meet that requirement.

Each of the six mission goals is restated below in association with a context section that identifies critical issues for park management. The Partnership, the Advisory Council, park visitors, interested agencies and organizations, and the general public have identified and refined the issues addressed by this plan.

Policies to assist park managers in implementing this plan are presented after each goal. The policies provide direction for day-to-day management decisions. The guidance provided by policy is general in some cases and specific in others: It may prescribe the process by which decisions are made, how an action is to be accomplished, or the results to be achieved. Clearly stated parkwide policies ensure consistent management throughout the island system and meet the mandates of the federal enabling legislation.

Like policies for all national parks, policies for Boston Harbor Islands originate in law. Some applicable legislation is general, such as the National Park Service Organic Act. Other legislation is specific, like the 1996 enabling legislation for Boston Harbor Islands that contains particular policy mandates (see Establishment of the Park).

The following policies build on the park's legislated mandates and Park Service policy that applies to the national system. Other laws, regulations, and policies related to the administration of federal and state programs, although not cited in this plan, also apply. Where policies or guidelines have not been

developed, the law serves as the only direction. Boston Harbor Islands Partnership agencies are already managing the islands in a manner congruent with national policy in most instances. This is certainly true within Boston Harbor Islands State Park.

RESOURCE PROTECTION

CONTEXT

The broader ecosystem and cultural context of the islands includes both natural and cultural resource systems that extend inland to metropolitan Boston and eastern Massachusetts, and offshore into Massachusetts Bay, part of the Gulf of Maine. On many islands these cultural and natural resources converge, resulting in layers of ethnographic, archeological, and historic resources laid over the natural landscape, which poses questions about management emphasis.



Bumpkin Island

Ever since their formation by glacial activity about 14,000–18,000 years ago the islands have been and continue to be shaped by natural processes that extend well beyond present-day Boston Harbor. Meteorological and coastal processes such as storms, tides, and winds rework the island landforms and bring airborne components. Plant and animal communities adapt to the environment and bring about their own changes to the system. Water flowing from the Boston Harbor watershed and the Gulf of Maine surrounds and influences the natural system.

The Boston Harbor Islands were shaped as well by human activities, such as dredging and filling, which continue to shape and reshape some of them. Non-native species have found their way to the islands as a result of human activity and compete with native species for survival. Settlement of the country by Europeans destroyed American Indian cultural systems. Other groups have traditionally been associated with the islands such as Portuguese, Irish, farmers, lighthouse keepers, and fishermen. Today, social

systems of urban Boston, the inner city, and surrounding harbor communities interact with the islands to varying degrees. Sites important to contemporary cultural groups are in large part unidentified and unprotected.

Remaining historic structures are in varying conditions; some, like Fort Andrews, stand vacant and are disintegrating, and others, like the older seawalls, are subject to loss as a result of natural processes. The decentralization of museum collections (i.e., artifacts from the islands held by various agencies) complicates the processes of inventory control and collection use and development. No guidelines have been defined for the scope of collections.

GOAL

The Boston Harbor Islands as a whole, containing natural, geologic, cultural, and historic resources and associated values, are protected, preserved, or restored, and managed within their broader marine and coastal ecosystem and their cultural context.

This goal encompasses the broad mandate of the NPS Organic Act and subsequent legislation “to conserve the scenery and the natural and historic objects and the wild life therein.” The broad ecosystem and cultural context includes both natural systems and cultural systems that extend beyond the park into the Boston metropolitan area and Massachusetts Bay. Cultural and historic resources include archeological sites, collections and archives, historic structures, cultural landscapes, and ethnographic resources. Natural and geologic resources include vegetative communities, animal populations and their habitats, island landforms, along with the surrounding air and water.

Actions that protect and preserve natural, geologic, cultural, and historic resources for current and future generations support this mission goal. For instance, historic structures are stabilized, rehabilitated,



Gull Nest, Gallop's Island

restored, or adaptively re-used; plant and animal communities are preserved or restored to a prior condition and protected from human manipulation, leaving natural processes to dominate. In some cases these biotic communities are managed to preserve vistas, retain cultural landscape characteristics, or to reflect the historic vegetative communities that once occupied the islands; or selected breeding habitat is protected from human disturbance.

POLICIES

General Natural Resource Management

The primary management objective for natural systems is the protection of natural resources and values for appropriate types of public enjoyment while ensuring their availability to future generations. These values include “naturalness,” which denotes minimal human influence. Natural resources are managed with a concern for fundamental physical and biological processes, as well as for individual species, features, and plant and animal communities. Natural change is recognized as an integral part of the functioning of natural systems, which include:

- physical resources such as plants, animals, water, air, soils, topographic features, geologic features, and natural soundscapes
- physical processes such as weather and shoreline migration
- biological processes such as photosynthesis, succession, and evolution
- highly valued associated characteristics such as scenic vistas

Management of natural systems is based on the park’s management areas (or geographic zones) as established in the general management plan and includes upland and intertidal areas. (The waters of Boston Harbor are not included within the park boundary.)

Restoration of Natural Systems

The Partnership may re-establish natural functions and processes following human disturbance. The Partnership restores the biological and physical components of natural systems as necessary. Restoration efforts may include removal of exotic species, removal of contaminants and structures or facilities, or restoration of areas disturbed by park management or infrastructure development.

Biological Resource Management

Native Animals and Animal Populations

The Partnership seeks to perpetuate native animal life (mammals, birds, reptiles, fish, insects, worms,

crustaceans, etc.) as part of the natural ecosystems of the park. Management emphasis is on minimizing human impacts on native animals and the dynamics of natural animal populations. “Native animal life” is defined as all animal species that as a result of natural processes have occurred, now occur, or may occur in the future on lands within the park.

Native animal populations are protected against harvest, removal, destruction, harassment, or harm through human action. Individual animals within a population may be removed only when specifically permitted by state or local laws (see policy on fishing, hunting, and trapping), when a planning process has determined that removal or control will benefit park resources or enhance visitor safety, or when removal has been deemed necessary as part of an approved research project. Natural processes are relied on to control populations of native species to the greatest extent possible. Nonnative (exotic) species are managed to prevent their displacing of native species. Populations of migratory species and their habitats (such as neotropical migratory birds) are preserved, and the park cooperates with others whenever possible to accomplish this in areas outside the park.



Peddock's Island

Native Plant Life

The Partnership seeks to perpetuate native plant life (such as vascular plants, ferns, mosses, algae, fungi, bacteria) as part of natural ecosystems. Plants and plant communities may be manipulated only when necessary to achieve approved management objectives. Native species are restored in the park where it is determined suitable and feasible. To the maximum extent possible, plantings consist of species that are native to the park or that are historically appropriate for the period or event commemorated.

Genetic Resources

The Partnership strives to protect the full range of genetic types (genotypes) of native plant and animal

populations in the parks by perpetuating natural evolutionary processes and minimizing human interference with evolving genetic diversity.

Protected Species

In cooperation with appropriate state and federal agencies, the Partnership identifies and actively promotes the conservation of all federally listed threatened, endangered, or candidate species within park boundaries and their critical habitats. The Partnership also identifies and protects all state and locally listed threatened, endangered, rare, declining, sensitive, or candidate species that are present in the park, and their critical habitats.

Nonnative Plants and Animals

Nonnative plant and animal species may be removed wherever it is determined that their presence poses a threat to other park resources or to public health and safety. Control of pest species is accomplished using integrated pest management (IPM) procedures, a process that ensures the most effective, economical, and environmentally sensitive methods of control. (Under IPM, “pests” are regarded as organisms that interfere with the purposes or management objectives of the park or that jeopardize human health and safety. Depending on its activity, an organism can be a pest in one area but not at another site.)

Pest Management

Strategies for managing pest populations are influenced by whether the pest is an exotic or native species. Many fungi, insects, rodents, diseases, and other species that may be perceived as pests are native plants and animals existing under natural conditions as natural elements of the ecosystem. Integrated pest management (IPM) is the coordinated use of pest and environmental information with available pest control methods to prevent unacceptable levels of pest damage by the most economical means and with the least possible hazard to people, property, and the environment. IPM procedures are used by the Partnership to determine when to control pests and whether to use mechanical, physical, chemical, cultural, or biological means.

Fire Management

The Partnership takes measures to prevent human-caused wildfires and their potential adverse impacts on human life, facilities, or park cultural or natural resources. Methods to accomplish this are those minimally necessary, commensurate with effective control. Prescribed fires may be employed to

accomplish resource management objectives in accordance with implementation plans approved by the Partnership.

Water Resource Management

The Partnership seeks to perpetuate surface and ground waters as integral components of park aquatic and terrestrial ecosystems. Park waters—either surface waters or ground waters including fresh, estuarine, and marine waters—are withdrawn for consumptive use only where such withdrawal is absolutely necessary for the use and management of the park and when studies show that it does not significantly alter natural processes and ecosystems. The Partnership seeks to restore, maintain, or enhance the quality of all surface and ground waters within the park consistent with the Clean Water Act and other applicable federal, state, and local laws and regulations. Adequate sewage treatment and disposal is provided for all public use and administrative facilities. Human activities are managed to control erosion into surface waters. Fuel-burning watercraft and marina operations and other activities with high potential for water pollution are regulated and controlled as necessary. Toxic substances, such as pesticides, petroleum products, and heavy metals, are managed to minimize the risk of water contamination. The intensity of use may be regulated in certain areas and at certain times if water quality monitoring studies indicate overuse.



Peddock's Island

The Partnership will, in consultation with local conservation commissions, avoid the occupancy and modification of floodplains and wetlands whenever possible. Where no practicable alternatives exist, mitigating measures are implemented to minimize potential harm to life, property, and the natural values of these important resources. The Partnership inventories wetlands and those floodplains subject to or potentially subject to public use or development. Activities that involve the use of floodplains and

wetlands are identified, and implementation plans for their protection or restoration are prepared.

Since the park's boundary excludes harbor waters from the Partnership's jurisdiction, the Partnership cooperates with others holding responsibilities for protecting harbor waters.

Air Resource Management

The Partnership seeks to perpetuate the best possible air quality in the Boston Harbor Islands, assuming an aggressive role in promoting and pursuing measures to safeguard park resources from the adverse impacts of air pollution. Air quality-related values of the park are inventoried, monitored, and evaluated periodically to identify pollution sources and enable managers to take effective corrective measures in collaboration with other regional and national authorities.

Noise and Light Management

The Partnership, while recognizing that the park is located in an urban environment containing human-generated noise and light, discourages the production of excessive noise caused by mechanical or electronic devices and of artificial lighting not needed for security, safety, cultural resource requirements, or interpretation.

Natural lightscapes are natural resources that exist in the absence of human-caused light; they vary with geographic location and season. The Partnership protects natural darkness and other components of natural lightscapes, recognizing the roles that light and dark periods play in the natural resource process and the visitor experience.

The natural ambient soundscape is the aggregate of all natural sounds that occur, together with the physical capacity for transmitting sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The Partnership preserves the natural ambient sounds of the islands and restores degraded soundscapes to the natural ambient condition whenever practical.

Geologic Resource Management

The Partnership preserves and protects geologic resources as integral components of park natural systems. As used here, the term "geologic resources" includes both geologic features, such as drumlins, and geologic processes, such as shoreline development.

Shoreline Management

In areas of the park managed for natural resources emphasis, shoreline processes (erosion, deposition, dune formation, inlet formation, and shoreline

migration) that are not influenced by human actions are allowed to continue without abatement. Exceptions would be made in cases where a law requires control measures. In instances where human activities or structures have altered the nature or rate of shoreline processes, the Partnership will, in consultation with appropriate state and federal agencies, investigate ways to mitigate the effects of such activities or structures. The Partnership complies with provisions of state coastal zone management plans prepared under the Coastal Zone Management Act (16 USC 1451 et seq.). Where erosion control is required by law, or where present developments must be protected to achieve park management objectives, the Partnership employs the most sustainable, sensitive, and effective methods feasible.

Soil Resource Management

The Partnership actively seeks to understand and preserve the soil resources of the park and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. Potential impacts on soil resources are routinely monitored, and management action is taken to mitigate adverse, potentially irreversible impacts caused by heavy visitor use.



Eroding Slope

General Cultural Resource Management

The Partnership protects cultural resources against theft, fire, vandalism, environmental impacts, and other threats, without compromising the integrity of the resources. With some differences by type, cultural resources are subject to several basic treatments, including, but not limited to, preservation in their existing states; rehabilitation to serve contemporary uses, consistent with their integrity; and restoration to

earlier appearances by the removal of later accretions and replacement of missing elements. (See Treatment of Historic Properties.) The preservation of cultural resources in their existing states always receives first consideration. Treatments, if applicable, are in compliance with the requirements of Section 106 of the National Historic Preservation Act.



Long Island Light

Treatment of Archeological Resources

Archeological resources are left undisturbed unless removal of artifacts or intervention is justified by protection, research, interpretive, or infrastructure requirements. They are preserved in a stable condition to prevent degradation and loss of research values or in-situ exhibit potential.



Lovell's Island

Underwater archeology

The Commonwealth of Massachusetts regulates underwater resources pursuant to M.G.L. Chapter 6, sections 179–180, and Chapter 91, section 63, to preserve and protect shipwreck sites for continued archaeological research and public enjoyment. A permit is required from the Board of Underwater

Archeological Resources for reconnaissance and excavation, regardless of whether it is an individual sport diver, commercial venture, or museum.

Treatment of Cultural Landscapes

The management of cultural landscapes recognizes and protects significant historic, archeological, ethnographic, and design values. All treatment decisions are based on a cultural landscape's significance, existing conditions, and use. Treatment decisions take into account both the natural and built features of the landscape, and the dynamics inherent in natural systems and continued human occupation.

Treatment of Ethnographic Resources

To appreciate the diverse heritages and resources related to the park, the Partnership identifies the present-day people whose cultural practices and identities were, and often still are, closely associated with the islands. In the context of collaborative research, cultural anthropologists document the meanings that groups assign to traditional natural and cultural resources and the landscapes they form. The Partnership maintains this information, as well as data on the traditional knowledge systems that affect resource uses.

Burial Sites and Cemeteries

As they are identified, historic and prehistoric burial areas—whether or not formally plotted and enclosed as cemeteries—are protected. They are not disturbed or archeologically investigated unless threatened with destruction by park infrastructure, operational activities, or natural forces. The Partnership consults with American Indians and other individuals and groups linked by ties of kinship or culture to ethnically identifiable human remains when such remains may be disturbed or are encountered on park lands. Detailed operating procedures for the Boston Harbor Islands are developed in consultation with American Indians, appropriate state agencies including the state historic preservation office, and professional archeologists.

Treatment of Historic Properties

Along with evaluating the significance of historic structures and landscapes, resource managers and planners determine the approach to the treatment of historic properties from one of the following standards established by the Secretary of the Interior.

- **preservation** focuses on the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time; this treatment includes “protection” and “stabilization”

- **rehabilitation** acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic character
- **restoration** depicts a property at a particular period of time in its history, while removing evidence of other periods
- **reconstruction** re-creates vanished or nonsurviving portions of a property for interpretive purposes

The factors that go into selecting a treatment are the property's historical significance, physical condition, proposed use, intended interpretation and feasibility.



George's Island

Use of Historic Structures

Because unused structures are susceptible to neglect and vandalism accelerating their deterioration, compatible uses for historic structures are found where appropriate. All uses of historic structures are subject to preservation and public safety requirements. No administrative or public use is permitted that would threaten the stability or character of a structure.

New Construction

In preference to new construction, every reasonable consideration is given to using historic structures for park purposes compatible with their preservation and public appreciation. New construction harmonizes with historic features in scale, texture, and continuity but does not imitate them (see Infrastructure Development Guidelines).

Museum Collections

Each Partnership member collects, protects, preserves, provides access to, and uses objects, specimens, and archival and manuscript collections. These are referred to collectively as "collections," or individually as "items." These collections are related to the disciplines of archeology, ethnography, history, biology, geology, and paleontology, and are used to aid understanding

among park visitors, and to advance knowledge in the humanities and sciences. As appropriate, the Partner agencies consult with culturally affiliated or traditionally associated groups before treating or reproducing items in museum collections. The National Park Service maintains a central museum collections database for the Partnership.

Carrying Capacity

Establishing, and then maintaining, appropriate types and levels of visitor use for the Boston Harbor Islands will help protect park resources and provide quality experiences for visitors. The question of how much public use is appropriate for a park area may be framed in terms of visitor "carrying capacity." Carrying capacity is defined as:

The type and level of visitor use that can be accommodated while sustaining the desired resource and social conditions that complement, and are compatible with, the purpose and significance of the park and its management objectives.

The National Park Service has developed a process known as "Visitor Experience and Resource Protection" to determine park carrying capacities. Carrying capacity is not simply a projection of the number of people that will visit an area. It is a prescription of desired ecological and social conditions.

Carrying capacities for the Boston Harbor Islands utilizes a scientific approach, such as the NPS Visitor Experience and Resource Protection process, to set levels of public use. Use levels are linked to the management areas in the general management plan, which describe, qualitatively, the desired resource conditions and visitor experiences by location. Monitoring the desired conditions takes the place of estimating the maximum number of users. This general management plan accomplishes the critical first steps in applying the NPS carrying capacity process to the islands (see Appendix 9). Through subsequent studies and plans, the Partnership first develops quantitative elements of the visitor experience and of resource protection. It then specifies standards which are measurable, and implements a monitoring and analysis program. Finally it takes corrective management actions when they are needed to maintain standards.

RESEARCH AND INFORMATION

CONTEXT

Currently, most scientific, historical, and cultural research about the resources of the islands is initiated

by outside researchers based on their professional interest or the availability of funding. Research is carried out by a variety of institutions and agencies; coordination is done largely through channels typical of academic exchange of information. Repositories of information and research are scattered throughout the region, in the libraries and offices of the Partnership agencies and universities, and even in the National Archives in Washington, D.C. Uncataloged collections are not readily available for research, interpretation, and exhibit. Many collections are not easily accessible and require special permission for consultation and reproduction.

Demographic data about visitors and the transportation services that visitors use have been collected incidentally rather than by direction, and they have typically been analyzed to serve particular islands rather than the entire system. Scientific and scholarly knowledge is important in developing carrying capacities for the islands. Human impacts on erosion, for example, have not been systematically monitored or quantified. Information is needed about park-associated groups, such as contemporary Indians, descendents of Portuguese fishermen, immigrants, and culturally affiliated sites. Management of ethnographic resources is a major responsibility of the Partnership. In summary, extensive baseline data are needed on natural and cultural resources and visitor use of all the islands, and the islands as a system.



Intertidal Investigation, Lovell's Island

GOAL

The Boston Harbor Islands Partnership contributes to knowledge about the island system; management decisions about natural, geologic, cultural, and historic resources and visitors are based on adequate scholarly and scientific information.

The Partnership has fundamental needs for information in order to make decisions about

managing natural, geologic, cultural, and historic resources within the island system. The Partnership also strives to contribute to scholarly and scientific research. To meet this goal the Partnership must identify scholarly and scientific research that is needed and encourage its development. It also must consult with park-associated communities.

POLICIES

Studies and Collections

The Partnership conducts and facilitates natural, cultural, and social science studies. These studies support the park mission by providing a cumulative and constantly refined understanding of park resources, along with an understanding of park visitors, the non-visiting public, and human interactions with park resources. This approach provides a scholarly or scientific basis for planning, development, and management decisions. The data and information acquired through studies conducted in the park are made available broadly—to park managers, the preservation and scientific communities, and the public—except when information must be withheld to protect sensitive park resources, or where legal restrictions apply. The Partnership promotes relationships with individuals and organizations qualified to perform research, and encourages them to direct their research toward park goals and the broader contexts within which park resources exist. The Partnership encourages independent researchers to follow NPS standards. Permission for independent research that would allow the physical disturbance of cultural resources or provide for the collection of objects or specimens in parks, is granted only when there is compelling evidence that the proposed research is essential to significant research concerns and that the purpose of the research can be reasonably achieved only by using park resources.



Marine Researcher

Inventory and Monitoring of Natural Resources

The Boston Harbor Islands Partnership assembles baseline inventory data describing the natural resources under its stewardship and monitors those resources at regular intervals to detect or predict changes. The resulting information is analyzed to detect changes that may require intervention and to provide reference points for comparison with other, more altered environments. The Partnership also uses this information to maintain—and, where necessary, restore—the integrity of natural systems, and to protect the public, the park staff, and the park infrastructure.

Inventory and Evaluation of Cultural Resources

The Partnership identifies and evaluates the cultural resources of the park to complete the park's information base. The resulting inventories provide the data required for nomination of resources to the National Register of Historic Places; for general park planning and specific cultural resource management proposals; for land acquisition, development, interpretation, natural resource management, and maintenance activities; and for compliance with legal requirements.

Social Science Studies

The Partnership seeks greater understanding of park visitors and the non-visiting public, and their relations to park resources, through collaborative scholarly investigations. Social science surveys and research address the desire to expand the diversity of populations served by the Partnership.

Ethnography

The Partnership facilitates a program of professional cultural anthropological research, designed to provide management with information about relationships between park resources and associated groups. Research is undertaken in cooperation with associated groups. Collaborative, interdisciplinary research on contemporary cultural systems and the resources of park-associated groups involves the groups in the design and implementation of the research and the review of research findings to the fullest possible extent. The Partnership provides individuals or groups involved with, or directly affected by the research with copies or summaries of the reports, as appropriate.

Preservation of Data and Museum Collections, and Protection of Research Potential

The Partnership takes or allows no action that would reduce the research potential of cultural resources

without an appropriate level of research and documented data recovery. Because research involving physical intervention into cultural resources or removal of objects is a destructive process, research employs nondestructive methods to the maximum extent possible. All research data and objects collected become part of the park museum collection.

VISITOR ACCESS, USE, AND ENJOYMENT CONTEXT

Several government agencies and nonprofit organizations offer the public a range of passive recreational and educational activities on the Boston Harbor Islands. While the opportunities are varied, individual visitors may choose to participate in only a few of the many potential activities. Currently each manager determines the appropriate types of recreational and educational uses for the islands based on its respective organizational mission. Most island visitation occurs during the summer, with some notable exceptions of year-round use, such as at World's End and Thompson Island. Visitors by ferry go to George's Island where 80 percent remain rather than disperse to other islands, raising questions of overcrowding.



Environmental Teaching Vessel, Boston Harbor

The level of visitor use is regulated largely by the capacity and frequency of ferry and water shuttle service to the islands and individual island management decisions. The current water transportation system is operated under a state contract with no public subsidy, and financial feasibility issues are ever present in a system that aims to keep fares affordable for families and to provide frequent service. Private boaters, however, have few management restrictions on access to the islands.

With the desire to increase visitation to some islands, the potential for overcrowding and resource

degradation exists. Some islands are closed to recreational use because the managing agencies use them for other public purposes. Water-based recreation is currently incidental in managing the islands, but it may become a more important component of the islands' use.

Although The Trustees offer visitor access 365 days a year at World's End, mainland experiences for Boston Harbor Islands visitors exist primarily at seasonal visitor contact stations located at a kiosk on Long Wharf on the Boston waterfront and at the courthouse at Fan Pier. Park information is available at the Hingham and Lynn departure points. The current water transit system to the Boston Harbor Islands is confusing to visitors and inadequate for expected demand.

GOAL

An expanded base of visitors enjoys and is satisfied with the facilities, services, commercial operations and recreational opportunities offered on the Boston Harbor Islands and at associated mainland sites. The attributes of these offerings include their availability, accessibility, diversity, quality, and safety.



Button Island

The park offers visitors a retreat within an urban environment and provides opportunities for the public to participate in appropriate resource-based recreational activities that satisfy a range of interests and skill levels consistent with resource protection goals. Enjoyment of the islands and their resources is a fundamental part of the visitor experience. This mission goal is inclusive of the mandate in the NPS organic act "to provide for the enjoyment of the [resources] in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Visitor enjoyment and safety are affected by the quality of park programs, facilities, and services,

whether provided by the Partnership, or others. Availability of park facilities, services, and recreational opportunities refers to convenient locations and times of operation that fit visitors' schedule needs, particularly multiple-season transportation to the islands from a sufficient number of mainland locations. Accessibility includes affordability and convenience for diverse populations; for special populations it refers to their accommodation, where appropriate, when visiting park facilities or when participating in authorized recreational activities. Diversity of facilities and services refers to a range of appropriate educational and recreational opportunities at various levels of expertise and interest for park visitors. It should be recognized that many appropriate uses may be harmful to park resources. Uses in which mitigation measures (including closure) may be necessary are: entering historic structures, which accelerates degradation and loss of historic fabric; and developing visitor service facilities and access terminals, which degrades natural habitat. Quality of facilities and services includes well-presented, knowledge-based orientation, interpretation, and education.

One of the mandates of the park's enabling legislation [16 USC kkk(a)(3)] is to improve access to the Boston Harbor Islands using public water transportation. In developing policy to address this mandate, several assumptions were made about water transportation:

- that passenger ferry service will be expanded in phases over time
- that additional gateways and routes will be added when there is demonstrated demand
- that island docks, which are controlled by park managers, will be open for commercial ferries under regulation by the dock manager
- that passenger ferry service is intended to be self-sustaining over time



Kayaking, Hingham Bay

POLICIES

Visitor Access, Use, and Enjoyment in General

The Partnership seeks to preserve park resources ‘unimpaired,’ while providing for public enjoyment of those resources. Because public enjoyment cannot be sustained if park resources are damaged or compromised, resource protection must necessarily be the Partnership’s paramount responsibility. Within that constraint the Partnership encourages people to visit specific islands, and to pursue appropriate inspirational, educational, and recreational activities related to the resources found in these special environments. While not having jurisdiction over the waters of Boston Harbor, the Partnership cooperates with others to provide recreational experiences on the water sheet. The use of the park is essentially resource based, but nonconsumptive of resources.



Boston Light Tour, Little Brewster Island

Use Management

Visitors are given appropriate information to encourage safe and lawful use of the Boston Harbor Islands and to minimize any resulting adverse impacts on natural, geologic, cultural, and historic resources. The Partnership coordinates the management of visitor use and whenever necessary regulates the amount and kind, and the time and place, of visitor activities. Any restrictions on visitor use are based on a determination that such measures are consistent with the Boston Harbor Islands’ enabling legislation and are needed either to prevent derogation of the values and purposes for which it was established or to minimize visitor use conflicts. The park’s enabling legislation states that recreational uses shall be consistent with the general management plan. It also gives specific guidance on hunting and fishing (see below).

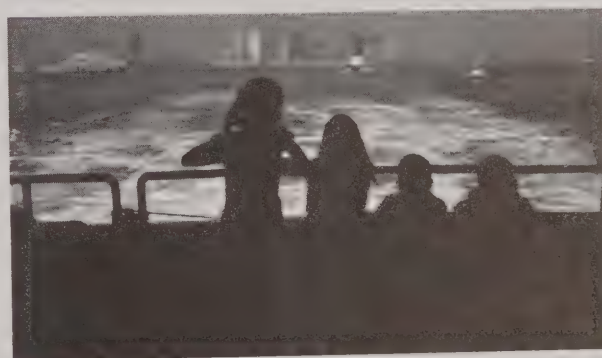
To the extent practicable, public use management is based on the results of scholarly research, studies, and other support data, including public surveys and resource monitoring programs as part of the “Visitor

Experience and Resource Protection,” carrying capacity process (see Carrying Capacity, page 35, and Appendix 9).

In summary, uses and activities in the park are consistent with applicable legislation, promote visitor enjoyment of park resources through a direct association or relation to those resources, are consistent with the protection of resources, and are compatible with other visitor uses.

Accessibility

The Partnership makes every reasonable effort to make the facilities, transportation systems, programs, and services of the Boston Harbor Islands usable by all people, including people with disabilities. Visitor and management facilities and transportation systems are made as physically accessible as practicable, depending on the nature of the area and of the facility, to persons with visual, hearing, mobility, and mental impairments. One primary tenet of disability requirements is that, to the highest degree feasible, persons with disabilities should be able to participate in the same programs and activities available to everyone else. Accessibility is provided consistent with preserving park resources and providing diverse, high-quality visitor experiences. The determination of what is reasonable is made only after careful consultation with disabled persons or their representatives.



Ferry to the Islands

Access and Circulation Systems

Consistent with preserving park resources and providing diverse, high-quality visitor experiences, the Partnership seeks to provide reasonable access to the park and to ensure that the means of circulation within and on the surrounding lands and waters foster convenient enjoyment of park resources.

Water transportation contributes to the overall visitor experience. The ferry trip is a pleasurable and educational experience introducing the visitor to the

harbor and to the islands. Water transportation service is comfortable, safe, and reliable, contributing to a quality visitor experience.

Visitor access is affordable. The cost of island access is affordable, taking into consideration the combined ferry, land transportation (transit and/or parking), and any additional fees.

Mainland docking facilities are reserved on a long-term basis. The ferry terminals have long-term arrangements so that docking facilities are available for authorized island ferry and water shuttle providers. This provides park visitors with assurance that terminals remain in the same locations over long periods of time.

Gateways endorsed by the Partnership meet certain standards. Mainland gateways to the park are, by definition, waterfront locations with docking facilities. They provide embarkation to the islands along with visitor orientation. Some gateway locations may be staffed and some may not be, and standards vary with the level of staffing. The following standards apply to all official gateways.

- Sited to maximize intermodal access: Mainland gateways should be located near public, multi modal transit systems including highways, bikeways, and ferries.
- Parking: Where feasible the gateways should also provide parking for island visitors.
- Piers: Mainland gateways should have a pier that accommodates regularly scheduled island transportation and meets other program requirements such as access for the disabled.
- Identity: A uniform park identity sign package should be located at each gateway. It includes “entrance” signs, highway directional signs, and interpretive panels.
- Visitor amenities: At a minimum, seating and a shade shelter should be present.



Pier for Water Shuttle

Staffed gateways bring additional requirements.

- Visitor contact station: A point of contact for potential visitors should be made available. This staffed facility could “piggy-back” on existing visitor facilities.
- Sales: Island-related retail sales areas should be present.

Dock facilities, ferries, and water shuttles meet performance standards set by the Partnership.

Dock facilities accommodate various sizes of vessels and provide safe access on and off the vessels.

Performance criteria for ferry and water shuttle services address reliability of service and schedules, guidelines to ensure resource protection, vessel wake and wash limitations, public safety, and standards for serving visitors with disabilities.

Navigation Aids

Necessary water navigation aids are planned in collaboration with the U.S. Coast Guard, and are installed and used in conformance with Coast Guard standards.

Commercial Visitor Services

Collaboration with the private sector is a basic tenet of the Partnership’s management coordination of Boston Harbor Islands (see Economic Activity Guidelines). Members of the Partnership may permit commercial services that support the park mission and that provide appropriate recreational opportunities for visitors, contribute to visitor enjoyment of park resources, and support or achieve applicable management objectives. Commercial services on the islands are guided by a commercial services plan that the Partnership develops.

Collecting

Park resources are not to be collected without specific authorization. Permits from the park manager may be issued to groups engaged in field studies wishing to “capture and release” specimens related to their studies. Low-impact consumptive uses of park resources, such as berry-picking for personal use, may be allowed.

Fishing, Hunting, and Trapping

The Commonwealth of Massachusetts regulates hunting, fishing, and trapping throughout the state generally, and holds the responsibility for the management of fish and wildlife within the park specifically. The Partnership works with appropriate state authorities so that wildlife management within the park conforms with National Park Service policies and the management emphasis of the park general management plan.²

Visitor Safety

The Partnership and its concessioners, contractors, and cooperators seeks to provide a safe and healthful environment for all visitors and employees. The Partnership works cooperatively with federal, state, and local agencies, organizations, and individuals to carry out this responsibility.

User Fees and Affordability

The Partnership makes every reasonable effort to offer transportation systems, programs, facilities, and services that are affordable to a diverse range of visitors. Basic park services are available free of charge. Reasonable and equitable fees may be instituted for transportation to the islands and special services, offered parkwide or at specific locations in the park.

Special Events

Special events, such as sporting events, pageants, regattas, public spectator attractions, entertainment, ceremonies, and large encampments, may be authorized under permit by the Partnership members when there is a meaningful association between the park and the event, and the events do not damage resources. The Partnership does not permit the staging of special events that are conducted primarily for the material or financial benefit of participants, that involve commercialization or advertising by participants, or for which a separate public admission fee is to be charged, unless the event is directly related to the purposes for which the park was established.



Metropolitan District Commission Marching Band

EDUCATION AND INTERPRETATION CONTEXT

Understanding why the park exists and the significance of its resources grows from a visitor's enjoyable park experiences. Members of the Partnership, and many other entities, present general information and programs about the Boston Harbor

Islands. The state park runs programs on those islands that it operates that are open and staffed (five or six islands in recent years). Ferry trips to the islands usually include narration developed by the ferry operator rather than the park. Written materials that are available on ferries include primarily the overall park brochure and ferry and water shuttle schedules. Rangers and volunteers lead tours on some islands on a limited schedule, and many islands have self-guiding tour brochures. Several islands have wayside interpretive panels. Seasonal visitor contact stations now operate at Long Wharf, from which 80 percent of visitors depart, and at the U.S. Courthouse on Fan Pier. NPS, DEM, MDC, and Friends of the Boston Harbor Islands (volunteers) staff these sites. DEM and MDC also provide staffed visitor information near the ferry piers at Hewitt's Cove (Hingham) and on George's Island, respectively. Each island that is staffed for visitors has some wayside orientation near the ferry pier and personnel who greet visitors. Some use has been made of Internet web sites by most of the Partnership agencies, but there has been little coordination of message among them. An overall park web site came online in the spring of 1999.

Dozens of educational organizations operate programs in the harbor and on the islands, and dozens more include some aspect of the islands and harbor in curricula without providing on-site experiences. Multiple themes are emphasized, leading to a lack of clarity about what the islands represent thematically. One island, Thompson, is dedicated to education in its two main programs: Outward Bound for a variety of clientele, with special emphasis on urban youth, and a small middle school for both day and boarding students. Surrounding communities as a whole are lacking in general knowledge and awareness of the islands' cultural and natural history.



Children's Program, Bumpkin Island

The Boston Harbor Islands national park area has great potential for illustrating aspects of our history and culture and for bringing urban dwellers to a better understanding of and appreciation for natural and cultural history and resources. The opportunity for education in this new park is one of its touchstones.

GOAL

Park visitors and the general public understand and appreciate the resources and values of the island system, through the park themes: Islands on the Edge, Home in the Harbor, Portal to New England, and Renewal and Reconnection.

Understanding why the park exists and the significance of its resources grows from a visitor's enjoyable park experiences. Satisfactory visitor experiences build public support for the Boston Harbor Islands. On- and off-site information, orientation, interpretation, and education (such as written materials, signs, exhibits, multimedia presentations, personal services, and the Internet) support this mission goal, which helps visitors discover the most significant meanings in the park—the park themes—and helps them make connections between natural, geologic, cultural, and historic resources and intangible values that are attributable to the resources. Understandings gained help visitors become active stewards of the resources.



Investigating Island Wind Patterns

POLICIES

General

The purpose of the Partnership interpretation and education program is to provide memorable educational and recreational experiences, and to foster the development of a personal stewardship ethic. Partnership programs do this by forging a connection between the park resources, the visitor, the community, and park management. They are successful when they use the right combination of original objects and places, firsthand experience, and effective media. The

Partnership maintains the organizational capability to deliver high-quality interpretive services.

Interpretation

Interpretation in the national park system is an educational activity that aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media. Interpretation interacts among the resource, the visitor, the community, and park management. The interpretive program is built around park-specific themes based on the park's legislative history, the park's resources, and the Partnership's management goals. The interpretive program seeks to provide each visitor an interpretive experience that is enjoyable and inspirational within the context of the park's tangible and intangible resource values. Interpretation also reaches out to park neighbors and community decision makers to stimulate discussions about the park and its values in a local and regional context. In addition, interpretive services help park employees better understand the park and its resources.

Quality interpretation is the shared responsibility of all levels of park staff and is achieved through research, planning, technical excellence in implementation, and constant reevaluation. Interpretive services and facilities are developed and operated in accordance with the park's enabling legislation, general management plan, interpretive themes, resource management plan, and other appropriate documents. Interpretation is based on research about the history, science, and condition of the resources, and on research about the needs, expectations, and behavior of visitors.

A balanced interpretive program addresses the following elements:

- **Information and Orientation.** Provide all park users with easy access to the information they need to have a safe and enjoyable park experience.
- **Understanding and Appreciation.** Provide visitors with a variety of services and information to foster a deeper appreciation and understanding of the resources and values of Boston Harbor Islands as well as of its regional context, and the larger state and national park systems.
- **Protection.** Provide visitors with a variety of opportunities to interact safely with and enjoy the resources of the park, while protecting those resources from overuse, unintentional damage, vandalism, and theft.

- **Participation and Skill Development.** Provide a variety of services and opportunities to aid and motivate visitors to develop park-oriented recreational skills when appropriate.
- **Dialogue.** Provide a means for the general public, park neighbors, and park managers to communicate their thoughts and desires to each other.
- **Education.** Provide interested users and educational groups with the information necessary to develop a thorough understanding of the park's resources, its regional context, the roles of the owners, and the entire national park system's significance and values.



Island Studies

Outreach, Environmental Education, Heritage Education Services

The Partnership encourages outreach services and employs them to disseminate park and resource information and interpretation beyond park boundaries, including members of the public who are unable to make on-site visits. Environmental education and heritage education services also encourage and provide information and assistance to local school students and teachers, organized groups, and educational institutions that wish to use park resources in their curricula. In all cases, the contents of special environmental education and heritage education programs should be relevant to the park resources.

Interpretation for Special Populations

The Partnership seeks to ensure, to the greatest extent possible, that interpretive programs provide equal opportunities to all visitors including the disabled, senior citizens, children, nontraditional park users, and international visitors.

MANAGEMENT AND OPERATIONS

CONTEXT

The Boston Harbor Islands Partnership brings together formally a dozen government and private entities for a common purpose. Along with a commitment to the islands, each entity brings its

own culture, operating procedures, staff, and financial resources. Federal, state, and municipal jurisdictions overlap across the island system, and management actions have not yet become coordinated in a parkwide system. The enabling legislation created a new method for funding this unit of the national park system. The method assumes that existing owners of park property continue their management obligations and responsibilities and mandates that there is a limit on federal funds in the ratio of three-to-one nonfederal-to-federal dollars. The nonfederal share may be in the form of cash, services, or in-kind contributions.

The various planning, management, accounting, reporting, and resource information systems still operate more according to individual agency practices than according to Partnership practices. Memoranda of agreement between partner agencies do not exist to demonstrate binding commitments. Public financial reporting requirements are made more difficult by continuing independent agency practices.

GOAL

Each member of the Boston Harbor Islands Partnership is committed to the funding, operation, and development of the park using best management practices, systems, and technologies to accomplish the park's mission.

In order to succeed, the Partners must support system-wide initiatives, regardless of the jurisdiction within which the activity will take place. To be responsive, efficient, and accountable, the Partnership must integrate its planning, management, research, accounting, reporting, and other communications systems. Integrating these systems will provide better cross-communication during operations and help the Partnership develop required reporting. Actions pertaining to organizational responsiveness, efficiency, and accountability support this goal.



New Visitor Kiosk, Long Wharf

POLICIES

Partnership Management

The Boston Harbor Islands are owned by nine separate governmental or institutional landowners. Consistent with the enabling legislation (16 USC kkk), the park is managed in partnership in accordance with applicable state laws and federal laws applicable to the national park system. The Partnership approaches decision-making through discussion and cooperation among members. The Partnership is committed to an open and publicly accountable method of conducting its business.

Management Planning

The Partnership adopts the four park planning processes applied to all units of the national park system: general management planning, strategic planning, implementation planning, and park annual performance planning. General management planning is the first phase of tiered planning and decision making. It focuses on why the park was established and what resource conditions and visitor experiences should be achieved and maintained over the long term.

Strategic Plan

The park strategic plan builds on the general management plan—the park mission, goals, and management areas. This process analyzes the park's capability to set and meet long-term goals in the foreseeable future through an assessment of its fiscal and human resources. This assessment also includes a description of the condition of the natural and cultural resources in the park and the capability of the park's infrastructure to meet long-term goals. This document determines the park's workload, budgets, and staffing allocations for up to a five-year period.

Implementation Plans

Implementation planning focuses on how to carry out a specific activity or project needed to achieve a long-term goal identified in the park strategic plan. The contents of implementation plans may vary widely, depending upon whether the plan is directing a specific project (e.g., reintroducing an extirpated species or developing a trail) or an ongoing activity (e.g., maintaining an historic structure or setting and maintaining a standard for a quality visitor experience). Implementation planning is generally deferred until it is clear that the activity or project is to be undertaken within two to five years. Deferring implementation planning helps ensure that decisions about how to best

achieve a certain goal are relevant, timely, and based on current data.

Evaluating Environmental Impacts

The park operates under many laws that require consultation and review by outside parties, notably the National Environmental Policy Act of 1969 (NEPA), the Massachusetts Environmental Policy Act, and Section 106 of the National Historic Preservation Act of 1966. In compliance with environmental laws, the Partnership ensures that the environmental costs and benefits of proposed management actions are fully and openly evaluated before actions are taken that may impact the human environment. Under the National Historic Preservation Act proposed actions are evaluated as to their potential effects. These evaluations include appropriate participation by the public; application of scholarly and technical information in the planning, evaluation, and decision-making processes; use of Partnership knowledge and expertise through interdisciplinary teams and processes; and aggressive incorporation of mitigation measures, pollution prevention techniques, and other principles of sustainable park management.

Financing

The Partnership presumes that new revenues will come from fund-raising, fee retention, and commercial sources, with the designation of the Island Alliance as the nonprofit organization that can provide a flexible mechanism for financial management of outside funds. The Boston Harbor Islands Partnership has voted on the following assumptions and principles for financing the park.

Assumptions

- Partnership members will continue their management obligations and ownership responsibilities and will continue to provide appropriate levels of support to their priorities and programs. They will not seek to offset base level support with new Partnership resources.
- A three-to-one, nonfederal-to-federal, match of funds will provide a guide for seeking appropriations to support the park, although the match is an accounting mechanism rather than a prescriptive funding mechanism.
- State legislation will be required to allow some of the following principles to be implemented.

Principles

- New funds will be sought through fundraising, fee retention, and revenue generation to support the

- mission and operation of the park, as allowed by law.
- Partnership members will support each other to obtain additional resources to fund new programs and meet infrastructure needs.
- The Island Alliance will be the preferred vehicle for revenue generation, expenditure, and financial management in support of the other Partnership members.
- Revenues collected by a Partnership member will be retained and reserved by that member to support the park, to the extent allowed by law.
- Revenues generated by programs and activities developed, designed and/or implemented by or for the Partnership will first be used to support costs associated with that program. Surplus revenues will then go to the park according to recommendations made by the Finance Committee, in consultation with the Planning and Operations committees, and approved by the Partnership.

Financial Accountability Guidelines

- Each member of the Partnership identifies a record keeper and participates regularly in the Partnership finance committee activities.
- Each member agency presents a five-year capital spending plan and a projected three-year operating budget to the Partnership.
- The finance committee will, consistent with the general management plan, create a priority list from combined capital projects and operational needs that are beyond member agencies' funding abilities.
- The finance committee strategizes with Partnership agencies and potential outside funding entities to obtain support for priority projects. Funds are expended on projects in the most efficient manner. Each member agency implements projects according to the procurement rules specific to its agency, in keeping with these guidelines.
- Beginning January 15, 1999, each member of the Partnership tracks related costs and report them quarterly to the finance committee.
- Each member agency continues to be its own office of record for all documentation of Boston Harbor Islands park expenditures, including timesheets, requisitions, purchase orders, contracts, and invoices.
- The Partnership follows the relevant regulations of the Office of Management and Budget, which cover cost and auditing principles for state, local, and Indian tribal governments and nonprofit organizations.

- The Partnership uses these guidelines for any cooperative agreements with the National Park Service.



Lobster Boat, Boston Harbor

Donations and Fund-raising

The Partnership recognizes that the park requires funds from private sources for park operations and capital improvements, and that the Island Alliance has been established to raise such funds. Fund-raising is carried out in support of the park's general management plan and strategic plan. The Partnership reviews and approves advertising, promotional, and marketing materials associated with corporate donations for appropriateness and accuracy.

Economic Activity

In financing a portion of the park with private funds, the Partnership recognizes the vital role of private enterprise. It supports existing economic activities within and immediately beyond the park by encouraging the continuation of contracted water transportation services, the development of park-related sales items at gateways, encouraging appropriate interpretive excursions and activities by the private sector, and other means. The Partnership also encourages the private sector to support the principles of resource stewardship and adherence to the principles contained in the general management plan.

Development

Park infrastructure is the only development envisioned for the Boston Harbor Islands national park area, and it should be consistent with at least one of the following purposes:

- to protect and preserve park resources
- to support park programs and education
- to provide visitor safety or amenities
- to accommodate an increasing number of visitors
- to generate revenue for park programs and operations

- to support park management and maintenance

Projects costing more than \$500,000 will be reviewed by the NPS Development Advisory Board.



Spectacle Island Under Development

The following infrastructure development guidelines meld National Park Service policy with more specific guidance for the Boston Harbor Islands national park area. They guide all new construction in the park. “Infrastructure” includes structures, paving, program facilities, administrative facilities, utilities, etc.

Location

In general, new construction takes place in the park where infrastructure already exists or previously existed. Major facilities are placed only in appropriate management areas established by the general management plan and after consideration of carrying capacities.

Respect Scale of Individual Islands

Facilities are integrated into the park landscape and environs so as to cause minimum impact. Development does not compete with or dominate park features or seem out of scale with individual islands. A cohesive design theme reflects the purpose and character of the park as a whole. Standard designs and components may be used, but they are adapted as appropriate to the specific site and conditions as part of the design process.

Planning and Design

Planning and design of park infrastructure is accomplished by interdisciplinary, inter-agency teams constituted to meet the environmental, programmatic, and technical requirements of the project. Public input is sought at the earliest practical stage of planning and design.

Sustainability

Any development is programmatically and physically sustainable, with principles of conservation applied.

Life-Cycle Costs

All costs, including initial construction costs, ongoing maintenance costs, and operating costs, are considered in the planning, design, and construction of facilities.

Adaptive Use

Adaptive use of historic and nonhistoric buildings for uses such as visitor centers, hostels, and administrative offices is generally considered before new construction, assuming that an existing building can meet park objectives and its use is not an intrusion on significant natural or cultural resources. Use of historic buildings complies with all laws, regulations, and policies regarding the treatment and use of cultural properties.

Protection of Cultural Values

In areas of historic preservation emphasis, new visitor or administrative structures harmonize with the area and its cultural resources in proportion, color, and texture. No attempt is made to duplicate or mimic a historic design, nor is any modern construction to be portrayed to the public as historic.

Restoration

Natural, cultural, and historic features of the park are restored after research and planning have determined the appropriateness of restoration.

Accessibility for Disabled Persons

Visitor and management facilities and transportation systems are made as accessible as is practicable, depending on the nature of the area and of the facility, to persons with visual, hearing, mobility, and mental impairments. In meeting the goal of accessibility, emphasis is placed on ensuring that disabled persons are afforded experiences and opportunities with other visitors to the greatest extent practicable.



Battery Jewell, Outer Brewster Island

Utilities

Utilities are as unobtrusive as possible, with the least possible resource impact; municipal or other utility systems outside the park are used whenever

economically and environmentally practicable; where possible and authorized, the park participates in cost-sharing with municipalities and others in meeting new, expanded, or replacement park utility needs.

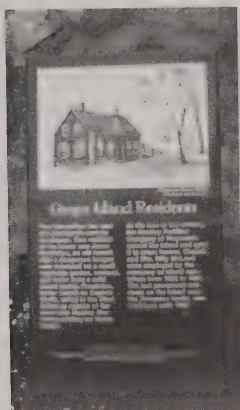
Sustainability

Boston Harbor Islands park operations, infrastructure, programs, and functions are models for the use of sustainable design, planning, construction, development, access, resource use, and maintenance. To achieve this, partnerships are formed that foster economically, environmentally, and socially compatible solutions.

Maintenance

The Partnership conducts a program of preventive and rehabilitative maintenance and preservation to protect the physical integrity of facilities so as to provide a safe, sanitary, and aesthetically pleasing environment for park visitors and employees and to preserve or maintain those facilities.

Signs



Signs are carefully planned and designed to fulfill their important role in conveying an appropriate park image and in providing information and orientation to visitors.

Grape Island

Solid Waste Management

The Partnership encourages environmentally sound solutions to solid waste management. All waste management decisions are based on a consideration of economics, proper use of resources (both personnel and physical), safety, effect on the total environment, and other factors of sound engineering and are in compliance with all federal, state, and local regulations regarding avoidance, amelioration, or elimination of environmental pollution.

Hazardous Materials and Toxic Waste

The Partnership makes efforts to avoid hazardous material incidents and to control or minimize them should they occur. Prevention includes acquisition of minimum quantities of hazardous materials; selection of the least toxic materials; implementation of safe use, storage,

and disposal practices; recycling of spent materials; and development of emergency response programs.



Digesters, Deer Island

Energy Management and Recycling

The Partnership conducts its activities in a manner that ensures that energy is used in a wise and economical manner and promotes the use of biodegradable materials, the reuse and recycling of materials, and other appropriate measures to minimize solid waste.

Public Health and Safety

The Partnership reduces the risk of illness and disease by protecting the health and well-being of park employees and visitors through the elimination or control of disease agents and modes of their transmission to humans.

Park Boundary and Land Protection

The Partnership uses all appropriate authorities to ensure that lands within park boundaries are protected.

EXTERNAL COOPERATION

CONTEXT

Two members of the Boston Harbor Partnership come from the Boston Harbor Islands Advisory Council, which was authorized by the park's enabling legislation to represent constituents of the island system. Another Partnership member, the Island Alliance, which has responsibility to generate private funds for the park, brings in representation from the private sector. A number of cities and towns surrounding the harbor, including Quincy, Hingham, Hull, Revere, and Winthrop, are listed in the legislation or have expressed interest in working with the harbor park. Tourism organizations, museums, cultural institutions, environmental groups, local governments, public schools, and more than 100 colleges and universities in the metropolitan area also possess skills and services to assist the Partnership.

GOAL

Park management is coordinated by the Boston Harbor Islands Partnership in cooperation with Indian tribes and historical, business, cultural, civic, environmental, recreational, and tourism organizations. Cooperators and individuals support the park mission through contributions and creative initiatives.

The Partnership pursues maximum public benefit through contracts, cooperative agreements, contributions of time and money, and other alternative approaches to support park operations. Actions that deal with park management and funding strategies carried out in cooperation with other government and nongovernment organizations and private donors support this goal.

POLICIES



Public Meeting, GMP Scoping

Consultation

In anticipating park actions, the Partnership consults, at the earliest practicable time, with federal agencies, state and local governments, potentially affected communities, Indian tribes, interest groups, and entities specified by law or regulation including, the state historic preservation officer and the Advisory Council on Historic Preservation.

Advisory Council

The Partnership consults regularly with the Boston Harbor Islands Advisory Council, and the Council is the primary mechanism used by the Partnership to consult with the public on matters of park planning and management, doing so through public meetings, workshops, and other general public forums. Notwithstanding the Council's role, the individual Partners also conduct public consultation independently on matters within their jurisdiction.

American Indians

The park's 1996 legislation highlights the importance of understanding the history of American Indian use and involvement with the Boston Harbor Islands and calls for protecting and preserving Native American burial grounds, particularly those connected with the King Philip's War. The law further provides a mechanism to consult with American Indians by requiring that the Advisory Council include representatives of organizations representing American Indian interests. In addition, numerous other federal and state laws establish policy regarding much broader and more comprehensive consultation with American Indians. Consistent with Department of the Interior and National Park Service policy, the Boston Harbor Islands Partnership consults regularly and actively with traditionally associated American Indian individuals or groups or tribes, which have cultural affiliation with the Boston Harbor Islands and King Philip's War, regarding park management including efforts to:

- conduct planning and prepare environmental assessments
- develop a park information base, recognizing the need to protect highly sensitive religious or cultural information
- manage natural, cultural, and historic resources, including archeological resources and museum collections
- prepare and deliver educational and interpretive programs
- develop park infrastructure

The National Park Service, as a member of the Partnership, carries out the responsibility of the United States to operate within a government-to-government relationship with the federally recognized tribes in relation to the Boston Harbor Islands.

¹ In 1916, Congress created the National Park Service in the Department of the Interior to “promote and regulate the use of the Federal areas known as national parks, monuments, and reservations by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (NPS Organic Act, 16 USC 1).

² Park Service regulations that prohibit the taking of wildlife, at 36 CFR Sec. 2.2. (g), are not applicable in this case because they apply only on lands and waters under concurrent or exclusive jurisdiction of the United States.

M A N A G E M E N T A L T E R N A T I V E S

DEVELOPMENT OF MANAGEMENT ALTERNATIVES

In this section, a preferred future direction for the Boston Harbor Islands is described along with two action alternatives. Underlying each alternative is a set of “management areas” which describes the desired future conditions of resources and desired future experiences for visitors in various places in the park. Each alternative applies the management areas differently according to the concept of that alternative. This section describes the management areas, the management alternatives, and the potential changes that may result from the application of each alternative. It also addresses ideas that were eliminated from consideration at this time.

The National Environmental Policy Act of 1970 (NEPA) requires that alternative management schemes be developed in a draft general management plan to set forth a reasonable range of ideas for managing the park. All alternatives, though diverse, should be feasible. If the managing entity is leaning toward one of the alternatives, regulations require that the draft plan identify the “preferred alternative” for the benefit of the public. The regulations also require that there be a “no-action alternative” presented, meaning, in this case, a direction that would retain the existing status, with no federal actions taken or additional federal funds spent. In this draft plan, the description of current management (page 12) serves as the “no-action alternative” required by NEPA.

In preparation for the development of alternatives, information on park resources, visitor use, and visitor preferences was gathered and analyzed. Information was solicited about the critical issues and the scope of the project from the members of the Partnership and Advisory Council, the public, government agencies, and special interest groups through newsletters, meetings, and personal contacts, which helped with the development of the preliminary concepts for the park’s future. All the concepts were intended to support the park’s purpose and significance, address issues, avoid unacceptable resource impacts, and respond to public desires and concerns.

Initially, the planners developed two alternate management concepts, A and B. “A” is a park where visitors could enjoy and discover nature and history, with emphasis placed on protecting important natural and cultural resources. The concept of “B” is the park

as a major recreational destination where many visitors would take part in varied activities on many islands, with the island resources as a backdrop. The two concepts were presented to the Partnership’s Planning Committee, the Partnership, and the Advisory Council in more than seven public meetings. Neither concept received complete support, but a consensus developed around a concept that modified the features of both A and B. The planning team, working with the Planning Committee, developed the concept of Alternative C, and the Partnership approved this direction in a vote on April 15, 1999 choosing Alternative C as the preferred alternative.¹ Following public review of this draft general management plan, more changes could be made to the preferred alternative, or a different proposal might even be developed.

After defining the alternative concepts, the Partnership Planning Committee identified six types of management that could be emphasized in geographic areas of the park.

MANAGEMENT AREAS

Management areas (sometimes called management zones) help determine the balance between resource preservation and visitor use in each part of the park. They describe a range of desired resource conditions and desired visitor experiences to be achieved and maintained over time, and as such, may be regarded as “management prescriptions.” For example, in an area of emphasis on “natural features” one would expect to see landscapes affected primarily by the forces of nature, and visitors would have many opportunities for solitude, whereas in an area of emphasis on “visitor services and park facilities,” one would see a “built” environment with some natural or historical elements, and visitors would expect to interact with many other people.

Management areas also identify the kinds and relative levels of visitor use, management activities, and infrastructure that are appropriate for maintaining the desired conditions. The list of uses and infrastructure development under each management area is used to help managers determine whether a specific action would be consistent with the overall direction established for the area. In designating management areas, an effort was made to apply areas to large sections of islands, or entire islands, to avoid fragmentation or a “spot-zoning” effect. This is possible because the management areas are not rigidly defined, but instead

describe a range of conditions and experiences to be achieved by park managers. They set the outlines of acceptable and unacceptable treatment and use. A particular use or development would not occur in *every* location where the management area is applied in the park, and before actions are taken at specific sites additional research and analysis would be needed.

In addition to the six management areas, certain resources would have special protection regardless of the geographic area in which they fall. These resource types are treated with a protection emphasis that is applied as an “overlay” anywhere in the park. The management areas for the Boston Harbor Islands national park area are applied in different locations and to varying degrees in the alternatives, resulting in separate desired future conditions for each alternative. By applying these geographic management areas differently in each action alternative, the future conditions would vary in alternatives A, B, and C.

Areas containing **Mainland Gateways** are facilities that welcome harbor islands visitors, providing boat access and information meant to foster a sense of anticipation about the adventure ahead. These urban, developed sites offer orientation, and may provide interpretive and educational programming to intrigue and draw in the visitor to the islands. Mainland gateways may be professionally staffed and have high levels of visitation and activity.

Areas of **Visitor Services and Park Facilities** emphasis are predominantly developed areas with some natural or historic elements. These areas feature a high degree of impact on natural resources while historic resources may be adaptively reused for visitor services. Visitors interact with each other in a built environment where they have a variety of amenities and conveniences. There is much opportunity for recreation, and cultural and educational activities.

Areas of **Historic Preservation** emphasis are designated to perpetuate historical settings, designs, materials, workmanship, or association. The historic resources are preserved, restored, reconstructed, or adaptively reused for visitor education and appreciation. Visitors expect to encounter a moderate to high number of other people as they explore and learn about the historic buildings, structures, and landscapes featured.

Areas of **Managed Landscape** emphasis are landscapes that are predominantly “open” space, managed to preserve their cultural and natural features, such as meadows, orchards, gardens, groves

of trees, and lawns. Visitors expect to encounter some people, but they also find many opportunities for solitude at certain times. Some visitor amenities are available, such as picnic areas, composting toilets, and ranger-led tours.

Areas of **Natural Features** emphasis are characterized by landscapes that appear to be affected primarily by the forces of nature such as wetlands, areas of successional growth, and densely wooded areas. The imprint of human influence is substantially unnoticed, and natural features dominate. Visitors have many opportunities for solitude and expect to see few other visitors. They have opportunities for challenges and adventure and they need to be self-reliant.

Areas of **Special Uses** contain a range of uses that were developed previously, including social service facilities, sewage treatment plants, a police firing range, a fire fighting training station, and a full-time school. Natural resources, in some cases, have been eliminated or highly modified to meet some of these needs. Some areas are restricted while others present visitors with opportunities to learn about the site through guided tours and other educational programs.

Some resource types, such as the following, would have **Special Overlay Protection** regardless of the area in which they fall. These areas may be closed to visitors at times, or they might be targeted for active management or research.

- breeding and nesting habitat (seasonal)
- steep slopes
- erosive soils
- marshes and wetlands
- shell fish areas
- eel grass beds
- threatened and endangered species habitat (plant and animal)
- archeological sites, cemeteries, and Indian burial grounds
- other critical or sensitive habitat
- cultural landscapes

M A N A G E M E N T A R E A S

Mainland Gateway



Visitor Services and Park Facilities Emphasis



Historic Preservation Emphasis



Future Resource Conditions

a developed environment
historic resources retain integrity and are adaptively reused to provide visitor services

predominantly developed setting with some natural elements
high degree of impact on natural resources
historic resources retain integrity and are adaptively reused to provide visitor services

resources perpetuate a particular historical scene
historic resources are preserved, restored, or reconstructed for the purposes of visitor education, understanding, and appreciation

Future Visitor Experiences

high level of activity and human interaction
“discovery” of the islands through off-site interpretation and educational programs
feeling of adventure and anticipation of trip to the islands

high visitor density and level of activity in a built environment
access to a variety and range of visitor services, amenities, and conveniences
opportunities for a mix of recreational, cultural, and educational activities

moderate to high visitor density
close interaction with historic buildings, structures, and landscapes with opportunities to learn about their history

Kinds and Levels of Potential Management Activity

primary treatment for historic resources is rehabilitation, as defined under the Secretary's Standards for the Treatment of Historic Properties*
staffed according to level of service

focus on providing visitors with conveniences and access to services
intensely managed to handle the flow of large numbers of people through the area
primary treatment for historic resources is rehabilitation*
staffed

historic resources are the primary focus and are managed for interpretation, education, and other compatible visitor uses while preserving the area's historic integrity
primary treatments for historic resources are preservation, restoration, and reconstruction*
natural resources are managed and manipulated according to the treatment of the historic resources which may include landscaping
intermittently staffed

*Secretary of the Interior's Standards for the Treatment of Historic Properties: Preservation focuses on the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time; includes protection and stabilization. Rehabilitation acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic character. Restoration is undertaken to depict a property at a particular period of time in history, while removing evidence of other periods. Reconstruction re-creates vanished or non-surviving portions of a property for interpretive purposes

Managed Landscapes Emphasis



landscapes are managed to preserve their character-defining cultural and natural features

Natural Features Emphasis



natural processes dominate
landscape generally appears to have been affected primarily by the forces of nature or to reflect significant ecological features

imprint of human influence is substantially unnoticeable

Special Uses Emphasis



resources have been developed for specialized uses

natural resources may be eliminated or highly modified

moderate visitor density with a likelihood of encountering others, but opportunities for solitude are available at certain times

setting is predominantly open space, but visitors have the comfort of certain amenities

low visitor density with opportunities for solitude

immersion in a natural landscape

opportunities for challenge and adventure

requires self-reliance

opportunities to learn about the site through guided tours and other educational programs

resources are managed to allow appropriate recreational uses, maintain viewsheds, and prevent erosion of shorelines

landscapes are maintained to provide recreational facilities and minimal visitor amenities

primary treatment for historic resources is preservation* or mitigation of negative impacts through appropriate documentation

critical or sensitive natural resources and habitats are fully protected

staffed according to level of use

minimal development and human intrusion into naturally functioning systems and processes

negative impacts on cultural resources are mitigated through appropriate documentation

natural resources managed for ecosystem protection

restoration of native species where appropriate

habitat and species restoration

invasive exotic species control (where appropriate and practicable)

some areas are closed to general public access for resource protection

not staffed

current activities continue (school, water treatment, police and fire fighter training, navigation, public health services facility)

intermittently staffed to offer guided tours

Mainland Gateway



Visitor Services and Park Facilities Emphasis



Historic Preservation Emphasis



Kinds and Levels of Potential Visitor Use

public transportation access
point to islands
parkwide orientation
interpretative activities and opportunities to learn about the islands
integration with nearby interpretive, educational, and experiential venues
obtaining provisions for trip to islands

transportation hub
parkwide orientation
interpretive and educational activities
environmental, demonstration programs
picnicking
motor boating
sailing
swimming
attending special events
overnight visits
dining
obtaining provisions for visit

interpretation through wayside exhibits, self-guided tours, and ranger staff

educational programs and activities

Kinds and Levels of Potential Infrastructure

pier
information kiosks
rest rooms
food services (snack bars, vendors, etc.)
ticket offices
interpretive media
park-related & souvenir shops
parking

visitor center or environmental education center or cultural center
marina
pier
amphitheater
restaurants and snack bars
convenience stores, souvenir shops
recreational equipment rentals
lodging facilities
rest rooms
paved trails and walkways
park offices and support facilities (employee housing, maintenance, utilities, etc.)

development is limited to the minimum necessary to provide fundamental visitor services, such as contact station or visitor center and museum, rest rooms, basic food services (snack bar, vending machines), shelter, and pier

historic buildings are adaptively reused where possible rather than using new construction

Managed Landscapes Emphasis



interpretation through
wayside exhibits, self-
guided tours, and ranger
staff

educational programs
and activities

walking
biking
swimming
picnicking
camping
fishing
motor boating
sailing, kayaking, canoeing,
rowing
wind surfing, sail boarding
sun bathing
beach combing
bird watching
cross-country skiing

pier
composting toilets
formal camp sites with
grills, picnic tables, tent
platforms
formal trails
picnic tables
shelters/gazebos
benches
trash receptacles

Natural Features Emphasis



self-guided interpretation
guided educational
programs and activities
nature study

bird watching
wildlife viewing
walking
beach combing
star gazing
fishing
sailing
kayaking, canoeing, rowing
primitive camping

primitive trails
primitive campsites
composting toilets
minimal signs for resource
protection and visitor safety
and regulation

Special Uses Emphasis



public has restricted access
and use; generally not
available for recreational
use

visitor access is limited to
guided tours

existing development
remains in support of
current use

CONCEPTS ELIMINATED FROM CONSIDERATION AT THIS TIME

Throughout the planning process the Planning Committee was presented with various ideas and concepts for the Boston Harbor Islands. In particular, ideas presented by audiences at public forums held throughout the region were discussed and analyzed by planners. The following ideas and concepts represent some of those ideas that, for various reasons, were reviewed but thought not to be viable at this time. Some represent ideas whose time is yet to come and others are ideas that may never be viable. They are noted here for future reference.

The adaptive reuse of facilities on the islands for such functions as a youth hostel, restaurants, bed-and-breakfast accommodations, a health and sports center, hotels, and conference centers had proponents. However, for Long Island, while the City of Boston has been opening parts of the island for public use, existing health and human service functions on Long Island and Moon Island are essential to the residents of the City of Boston. Those activities will remain secure on the islands until new appropriate locations can be found for these services. The alternatives do include the potential for long-range development on other islands.

Opening most islands to full public access was a concept desired by some but recognized by many as undesirable given the need to protect park resources. In addition to resource protection concerns, there are existing uses and activities that would need to be relocated outside the park. Certain of these current uses, such as a school, wastewater treatment facilities, and lighthouses, can be functionally and programmatically part of the park and contribute to its interpretive programs.

New recreational facilities, such as a golf course, roller-blade park, "extreme sports," dirt-bike trails, an amusement park, and casinos have been proposed. A consensus asserted that uses that can be provided on the mainland and that have no essential relationship to the harbor islands setting and the park mission should not be located on the islands.

Continuing private residential use of the Peddock's Island cottages met with both support and opposition. Currently there remain approximately 40 privately owned summer cottages. Under existing plans of the Metropolitan District Commission, the cottages are scheduled for evaluation and removal as their owners vacate them and turn them over to the MDC.

ATTRIBUTES COMMON TO ALTERNATIVES A, B, AND C

Conditions desired for the future of the park are expressed in the management areas as applied in each alternative. Many actions required to achieve these conditions are common to all the alternatives except the no-action alternative. These common actions are described below and are not repeated in the descriptions of individual alternatives.

Changes will occur on the islands and peninsulas in the park as this plan is implemented, and one of the most important is infrastructure change, which general management plans are required to address (see page 11). It should be noted, however, that of the 34 distinct areas considered in this plan, 16 would be expected to undergo little or no change in infrastructure, regardless of the alternative (see map). Other changes, such as the protection of resources and visitor experiences, would be expected over time.

MANAGEMENT AREAS COMMON TO ALTERNATIVES A, B, AND C

All three action alternatives list the same **potential mainland gateways**—ferry departure points with attendant information and orientation for the park visitor. Under the current system for the Boston Harbor Islands State Park, the departure points are at Long Wharf in downtown Boston, Hewitts Cove in Hingham, and the Heritage State Park in Lynn. Four municipalities along the harbor have expressed keen interest in having their sites designated as departure points in the future. The access and circulation policy spells out criteria for developing future gateways. As the park evolves, as the visitation grows, and as the water transportation system is able to sustain expanded service, additional gateways would be designated by the Partnership.

Areas of **special uses** also are the same in all three alternatives. The special use designation recognizes the distinctive areas of the park that would not undergo change through this general management plan. These areas are found on Deer and Nut islands, which have wastewater treatment facilities; on Long and Moon islands, which have social service and public safety facilities; on Thompson Island, which operates an educational campus; and on Nix's Mate, which is now a remnant of its original size and contains only a navigation marker.

Common to all three alternatives are areas of Spectacle and George's designated for **visitor services**

and park facilities emphasis.

Areas of **historic preservation** emphasis found in all action alternatives are on George's, Long, Lovell's, The Graves, and Little Brewster islands.

Areas with **managed landscape** emphasis are found on portions of Deer, Spectacle, Long, Peddock's, Lovell's, Thompson, and World's End, and all of Grape, Bumpkin, Gallop's, and Webb State Park.

Natural features emphasis areas are designated on Outer Brewster, Middle Brewster, Green, Little Calf, Shag Rocks, Snake, Sheep, Hangman, Raccoon, Ragged, Sarah, and Button.

RESOURCE PROTECTION STRATEGIES COMMON TO ALTERNATIVES A, B, AND C

The protection of resources would be the responsibility of each managing agency, and all resource preservation actions would be guided by policies described in the Goals and Policies section. Natural and cultural resources would be monitored to avert overuse. Critical or sensitive natural resources would receive special emphasis. Historic landscapes on Thompson Island and World's End would be preserved and managed.

The Partnership would prepare and periodically update a resource management plan. The plan would identify, define, and program the monitoring, inventory, research, mitigation, and interpretation of resources and visitor-protection activities required to perpetuate park natural resources and physical and biological processes. The resource management plan would also define and program activities needed to identify, evaluate, treat, and provide for the public understanding and enjoyment of cultural resources. Cultural resources would be preserved according to the Secretary of the Interior's standards for treatment of historic properties.

Carrying Capacity

Visitor management plans would be established using the Visitor Experience and Resource Protection process for each management area and then applied to each island. The process (described under Goals and Policies and in Appendix 9) calls for scientific analysis to determine the natural and cultural resource conditions and visitor experiences desired in the park. Partnership agencies would continue employing their existing administrative carrying capacities until new scientific ranges are established parkwide or unless significant damage to resources due to overuse is evident.

RESEARCH AND INFORMATION STRATEGIES COMMON TO ALTERNATIVES A, B, AND C

All research and information actions would be guided by policies described earlier.

In addition to establishing carrying capacity, the Partnership would encourage a range of research needed for the park, disseminate research findings widely, and use those scholarly and scientific findings as a basis for resource protection and visitor use management. Of highest priority would be an inventory and monitoring program for both natural and cultural resources. These would include vegetation and shoreline survey, historic structures reports for major structures, historic resource studies, cultural landscape studies of Long, Peddock's and Thompson islands, archeological investigations, and ethnographic studies with emphasis on American Indian tribes.

An electronic clearinghouse, rather than a central park repository, would be maintained by the NPS. The existing NPS geographic information system database, an important tool for analysis of natural resource protection needs and visitor use patterns, would be expanded.

VISITOR ACCESS, USE, AND ENJOYMENT STRATEGIES COMMON TO ALTERNATIVES A, B, AND C

All actions to further visitor access, use, and enjoyment would be guided by policies described earlier.

A park identity and marketing program (logo, park signage system, directional signage, etc.) would be developed under the action alternatives. A system of mainland information kiosks, wayside exhibits, and other interpretive media would orient visitors before they embark on a ferry. At the hub islands visitors would have the opportunity to go to other islands by water shuttle. There would be an increase in number of visitors overall, although the distribution of visitors would not be even throughout. Some islands would have few visitors while other islands would have many. Islands with regular shuttle boat service would have park ranger staff, guided and self-guided tours, locational signs, interpretive signs, and composting toilets. Hub islands would have potable water, toilets, food service, and staff. On islands with camping, there would also be potable water and composting toilets. Cooperative arrangements would be made with relevant law enforcement agencies in the harbor for protection of visitors.

Transportation

The water transportation system provides most visitors with access to the park. Islands that are now connected to the mainland would generally not receive a large number of visitors by land because of limited parking and neighborhood concerns about increased traffic. An exception is World's End, which accommodates about 60,000 visitors a year. Mainland gateway areas would be developed in response to demand and infrastructure requirements. Ferries would travel from mainland gateways to hub islands, where water shuttles would operate in loops to several other islands. Excursions to certain islands, such as Little Brewster, might operate directly from a mainland gateway as well as from hub islands. In addition, there could be private water taxi service available on call. Ferries would operate frequently in the summer and less frequently in spring and fall, with special trips in the winter. The transportation system would be operated by private boat operators under contract to the Partnership or its member agencies. Responsibility for dock management would be held by the island managing agencies. The transportation system would be monitored and evaluated periodically and adjusted as needed.

EDUCATION AND INTERPRETATION STRATEGIES COMMON TO ALTERNATIVES A, B, AND C

All education and interpretation actions would be guided by policies described earlier.

A comprehensive sign program would help interpret the islands for visitors. Guided tours would be available routinely during the day on the main islands, and programs would be run from either a mainland gateway or an island hub for special interpretive tours on a schedule established each season. Areas of emphasis would be derived from the park themes and include learning about the ecology and geology of the harbor, and the role of the islands in coastal protection. Before embarking on a ferry, visitors would learn about the park through a system of mainland information kiosks, wayside exhibits, and other interpretive media. Curriculum-based programs would be developed through Partnership and Advisory Council members for regional and national audiences.

Educational programs and interpretive waysides throughout the island system would raise public awareness about the presence, culture, and history of American Indians on the Boston Harbor Islands. Not only would specific reference be made to the King

Philip's War period and thousands of years of occupation, but to the philosophy that guides American Indians' understanding of nature and ecology and their relationship to the universe.

MANAGEMENT AND OPERATIONS STRATEGIES COMMON TO ALTERNATIVES A, B, AND C

All management and operations actions would be guided by policies described earlier.

Islands would continue to be managed by existing managers with overall policy established by the Boston Harbor Islands Partnership. Each island open to the public would have resource protection, interpretive, maintenance, and administrative staff necessary to maintain parkwide standards. Coordination among island managers would be done by the Boston Harbor Islands Partnership, operating largely through committees. Staff support for the Partnership and the Advisory Council would be provided primarily by NPS with support by Partnership agency personnel as available.

Potential Facility and Infrastructure Changes

Facilities would be improved to meet high quality standards and to unify the park visually and thematically. All new infrastructure would be guided by an environmentally sensitive philosophy following the park's infrastructure development guidelines and in accordance with the management area in which it occurs. Any development undertaken would support park goals and development costing more than \$500,000 would be reviewed by the nationwide NPS Development Advisory Board.

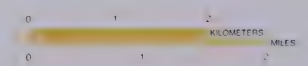
The following are some possible changes that could occur in any of the action alternatives.

- handicapped-accessible piers
- visitor contact stations or visitor centers
- sales of park-related items
- installation of utilities (water, electricity, communications, waste-disposal, heat) in certain areas
- an American Indian cultural center
- campsites
- administrative facilities
- maintenance facilities
- staff housing
- toilets
- shade shelters
- rehabilitation (adaptive re-use) of historic structures
- removal of selected deteriorated structures
- restoration of natural landscapes



POTENTIAL INFRASTRUCTURE CHANGES

- Legend**
- Potential Changes Under One or More Alternatives
 - Little or No Changes

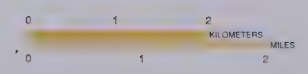




PROPOSED BOUNDARY

Legend

- Existing Park Islands
- Proposed Park Islands



- rehabilitation of cultural landscapes
- trails and boardwalks
- interpretive media
- boat moorings
- rental facilities for water sports

Costs

The alternatives outline broad conceptual-level changes that potentially could occur in infrastructure development. At this level of planning, attendant costs are approximate. These cost estimates are helpful in long-range planning, but should not be used for short-term budgeting purposes. These costs are only a general indication or characterization of potential capital and operating implementation costs.

Funding

Funds for park operations would come from all Partnership members except the Advisory Council. Federal funding would be provided in the ratio of one-to-three, federal-to-nonfederal dollars. Successful implementation of the plan is contingent upon increasing the financial contributions from private sources, raised primarily by the Island Alliance. Private funding would be expected to come from philanthropic and park-related revenues, use fees, and income from commercial operations. Public agencies would be expected to fund large infrastructure projects throughout the system.

At present the public agencies charge few fees. If revenues were being generated, it is understood that each island owner would use revenue first to maintain its own island operations. The Partnership is in the process of designing mechanisms for pooling and distributing revenue parkwide in accordance with priorities of the strategic plan. In all action alternatives, revenue could be expected from sales in visitor centers and gateway areas, rentals of equipment for interpretation or recreation, boat excursions with interpreters, food sales, and events such as concerts.

Legislation at the state level would be necessary to enable the creation and retention of fees by state and local agencies as well as the opportunity for long term leases to attract private investment.

Boundary Adjustment

In all alternatives, the boundary of the park would be expanded to include Nix's Mate, Shag Rocks, Snake Island, and Webb State Park. (See map, page 58.) The total acreage in these four areas is less than two-one hundredths the size of the existing Boston Harbor Islands national park area. Each of these sites is

topographically similar to and proximate to other islands in the park and contains resources which are related to the park's purpose and which should be protected. All owners support the inclusion of these sites, and none of the sites would be purchased. During the planning process, the Planning Committee determined that these properties are legitimate components of the island system and contribute to the overall goals of the park.

Nix's Mate is now a channel marker with a distinctive black-and-white buoy. It is the site of sea lore, including legends of captured pirates, and its image forms the logo for the Friends of the Boston Harbor Islands. It is maintained by the Coast Guard solely as a channel marker.

Shag Rocks is a 1.3-acre cluster of bedrock ledges lying east of Little Brewster Island. It contains bird nesting areas and is physically inaccessible but visually prominent from the other Brewsters. Shag Rocks, with no deed of ownership, is regarded as within the purview of the Coast Guard at Little Brewster, and has no maintenance needs.

Snake Island is a largely inaccessible eight-acre island in Winthrop containing mud flats and rich bird habitat. It is owned by the Town of Winthrop, which supports its inclusion in the national park area.

Webb State Park is a 15.5-acre site on a peninsula between the Back and Fore rivers in Weymouth containing one drumlin, a gravel beach, a meadow, small scrub growth, trails, and parking lot for fewer than 25 cars. It is the site from which American patriots fired on British troops in the "Battle of Grape Island" in 1775. It was acquired by the Department of Environmental Management in 1977 from the federal surplus property program, as a former Nike missile site. DEM administers Webb, which receives approximately 50,000 visitors per year, as part of its Boston Harbor Islands properties.

ALTERNATIVES A, B, AND C

CONCEPT

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This alternative emphasizes the preservation of the islands natural and cultural resources where visitors are encouraged to discover nature and history along routes described and laid out by park managers. The Boston Harbor Islands would be a park of adventure where visitors explore the islands nature and history. The adventuresome nature of a trip to the islands may mean that some visitors would prefer to view the islands from a boat or remain at the mainland portions of the park. Island visitors would find abundant opportunities for solitude.

A

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Under this alternative the park is the background or setting for a variety of recreational opportunities that meet the diverse interests of visitors. It would become a well-known recreation area in metropolitan Boston available for open-ended, unstructured experiences on the harbor and the islands, and which could have elements not specifically related to the resources of the Boston Harbor Islands. The Boston Harbor Islands would be a place where visitors would be encouraged to try the various programs while learning something of the natural and cultural history of the islands. Visitors would experience the park as a busy and highly active place.

B

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This alternative increases opportunities for visitors to discover the natural and cultural history of the Boston Harbor Islands while continuing to provide strong emphasis on preservation of the islands important resources. Park managers are challenged to provide visitors with creative, educational, and entertaining programs that provide meaning and bring the resources alive. The visitor has a menu of choices about where to go for a range of experiences, from immersion in cultural or natural history to recreational activities with resources as the backdrop. Visitors experience the park in its multifaceted possibilities, which focus attention and programs on cultural and natural history of the islands. Overall, the park is a place where resources are protected by instilling stewardship in visitors who return repeatedly to enjoy creative activities revolving around the islands resources.

C

MANAGEMENT AREAS

The **visitor services and park facilities** areas would occur on just two "hub" islands, George's and Spectacle. Each would have a sizeable visitor center and food service or a restaurant to allow the concentration of visitors on just two islands. The facilities would be located close to the pier.

The **visitor services and park facilities** areas in this alternative would occur on five "hub" islands, George's, Spectacle, Peddock's, Long, and Deer. Facilities associated with these island hubs (visitor centers or contact stations, food services, venues for concerts or other events) might be spread out beyond the immediate vicinity of the pier and contain a variety of attractions.

The **visitor services and park facilities** areas in this alternative could potentially be developed on five "hub" islands, George's, Spectacle, Peddock's, Long, and Deer, if ferry service demand warranted it. Not all "hubs" would have the same facilities. In the early years the primary hubs would be at George's, Spectacle, and Peddock's. Visitor facilities would be concentrated close to the pier and would include visitor centers or visitor contact stations, restaurants or food concessions, boat rentals, and small venues for events like concerts, historical pageants, and educational presentations.

Areas where the management emphasis would be on **historic preservation** would be found at the lighthouse at Long and around forts and fortifications on George's, Long, Lovell's, and Peddock's; on the lighthouse islands of Little Brewster and The Graves; and at the historic granite wastewater treatment structures on Moon.

Islands with **managed landscapes** where their predominant open-space character would be preserved include Gallop's, Grape, Bumpkin, most of Lovell's, the southern portion of Long, most of Spectacle, Webb State Park, the perimeter of Deer, and the park at Nut. Most of World's End would be managed to preserve the character-defining features of its cultural landscape.

Areas where the management emphasis would be on **historic preservation** are found at forts and fortifications at George's, Long, and Lovell's islands; also at lighthouses on Little Brewster, The Graves, and Long Island.

Areas of islands with **managed landscapes** where the cultural and natural features of predominantly "open" space would be preserved are found on Spectacle, Long, Lovell's, Deer, and Nut. Entire islands managed in this manner include Gallop's, Grape, Bumpkin, Rainsford, Great Brewster, Calf, Langlee, and Webb State Park. On Spectacle and Nut, certain paved trails could allow such sports as in-line skating.

Areas with management emphasis on **historic preservation** would be found at forts and fortifications at George's, Long, Lovell's, and Peddock's islands; also at lighthouses on Little Brewster, The Graves, and Long Island, and the historic granite wastewater treatment structures on Moon.

Islands with areas of predominantly open space and **landscapes managed** to preserve their natural and cultural features include Great Brewster, Gallop's, Rainsford, Grape, Bumpkin, World's End, Webb State Park, most of Thompson, most of Lovell's, the southern portion of Long, most of Spectacle, the perimeter of Deer, and the park at Nut.

Management emphasis on **natural features** would occur on all the Brewsters except Little Brewster and The Graves, on the southern half of Peddock's, the Hingham Harbor islands, Rainsford, Slate, Sheep, Raccoon, Hangman, Snake, and the eastern portion of World's End.

Islands that would have the management emphasis on **natural features** are Green, Little Calf, Middle Brewster, Outer Brewster, and Shag Rocks; Ragged, Sarah, Button, Slate, Sheep, Raccoon, Hangman, and Snake; Prince Head on Peddock's, and portions of Thompson.

The islands with management emphasis on **natural features** are all the Brewsters except Little Brewster, Great Brewster, and The Graves; the southern half of Peddock's; the Hingham Harbor islands; Slate, Sheep, Raccoon, Hangman, Snake, and portions of Thompson.

RESOURCE PROTECTION

Natural Resources

Some islands would be regarded unofficially as wilderness, where nature would be allowed to take over, and no visitor facilities would be provided. There would be a strong effort to reduce invasive plants and seize opportunities for revegetation on a number of the islands. Trails would be developed and maintained to encourage visitors to avoid compacting soil off trails. Small boardwalks would be built through portions of salt marshes. At Peddock's, the landscape would be rehabilitated after cottages were removed. Islands with disturbance-sensitive species would be closed to visitors during the nesting and fledging seasons, and other areas might be closed or restricted to protect threatened and endangered species.

The Brewsters, except for Little Brewster, would be open for primitive camping only by reservation and would be managed for natural resources. Boat tours for visitors would focus on awareness of habitat values.

Natural Resources

Some small islands, such as Snake, Sheep, Green, Calf, Little Calf, and Hangman, may be highly restricted to protect habitat. To accommodate visitors in other areas, many trails would be developed to encourage visitors to keep to trails and avoid unnecessary soil compaction. Extensive boardwalks would be built through salt marshes. More vegetation management may be done to enhance visitor access than in other alternatives.

Natural Resources

Some small islands, such as Snake, Sheep, Hangman, Green, Calf, Little Calf, Middle Brewster, and Outer Brewster, may be closed (or have seasonal restrictions) to protect habitat or nesting sites of wildlife that are disturbed by human presence.

Efforts would be made to reduce invasive plants in certain designated places, and to undertake a long-term revegetation program with appropriate species. Vegetation would be managed for habitat health and to maintain established views or to open up new views where appropriate. Sufficient trails would be developed and maintained to keep visitors on established pathways rather than wandering and increasing soil compaction. Boardwalks would be built through salt marshes.

Particular effort would be made to engage the public in stewardship of resources.

Cultural Resources

Cultural resource management would emphasize modification of some resources to serve visitors. Completing historic structures reports for threatened structures would be a high priority. Sea walls on islands would be repaired to serve visitors as well as to protect important cultural resources that are threatened.

Carrying Capacity

Visitor use would be managed, and potentially limited, using indicators that favor resource conditions.

Increases in the number of visitors on islands would be the lowest in this alternative.

Cultural Resources

Cultural resource management would emphasize preservation and rehabilitation. Completing historic structures reports for the most important resources would be a high priority. Sensitive archeological sites may be closed to visitors. Sea walls would be repaired where important cultural resources are threatened.

Carrying Capacity

Visitor use would be managed, and potentially limited, using indicators that favor visitor experience.

Increases in the number of visitors on islands would be the highest in this alternative.

Cultural Resources

Cultural resource management would emphasize preservation or rehabilitation. Stabilization may be done as an interim treatment until another treatment is selected. Completing historic structures reports for the most important resources would be a high priority. Sea walls would be repaired where important cultural resources are threatened.

Carrying Capacity

Visitor use would be managed, and potentially limited, using indicators that favor visitor experience in the more developed areas of hub islands and indicators that favor resources elsewhere.

Increases in the number of visitors on islands might be as high as in Alternative B.

RESEARCH AND INFORMATION

ALTERNATIVE

Baseline data on resources must be compiled first. Priorities for studies would be placed on those that lead to increased protection of resources and on the feasibility of re-establishing some native species.

A

ALTERNATIVE

Baseline data on resources must be compiled first. Priorities for studies would be on those that meet visitors' needs.

B

ALTERNATIVE

Baseline data on resources must be compiled first. Priorities for studies would be on the protection of resources in the areas of greatest visitor concentration, on the hub islands.

C

VISITOR ACCESS, USE AND ENJOYMENT

There would be numerous opportunities to learn about the islands from a tour boat or at a mainland visitor center without having to set foot on the islands; thus, some of the increase in visitation would occur on boats but not necessarily on the islands. Ferries would have interpretive programs with a park ranger aboard, providing orientation to the islands and staffing a mobile exhibit to show interpretive context. Exhibits and other interpretive media would be based on the islands cultural and natural resources. Self-guiding and guided tours would be available on islands served by water shuttle; these islands would have interpretive media and basic toilet facilities. Islands not on the water shuttle and served by excursions would have few amenities. On the more remote islands, visitors would see nature taking over. Some fragile islands, such as Snake, Sheep, Green, Calf, Little Calf, and Hangman, might be highly restricted to protect habitat. Activities such as picnicking, hiking, exploring historic ruins, swimming, sailing, and kayaking would be allowed in certain areas.

There would be emphasis on programs and recreational activities on the islands. Most visitors would go onto islands rather than relying on interpretive experiences on boats. Ferries and water shuttles would run frequently, allowing visitors to island-hop, having a range of experiences in a single day. Emphasis would be on visitors taking part in activities on islands without having to plan their itinerary in advance. Visitors would have access to most islands—including the Brewsters—and would find piers, interpretive media, and basic toilet facilities. Although some of the more remote islands would have no water shuttle service, excursions with rangers would occasionally bring groups in small boats. On these islands visitor facilities such as composting toilets, shade shelters, and cooking grills may be provided. Activities such as picnicking, hiking, exploring historic ruins, swimming, sailing, and kayaking would be encouraged. Equipment for water sports could be rented, and instruction would be available.

There would be emphasis on providing visitors with information in advance and encouraging them to tailor their visit for maximum interpretive value. Before embarking on an island trip, visitors would be encouraged to plan an itinerary for the day from brochures, web sites, and staff at gateway kiosks. There would be choices of activity as well as choices of island. Self-guiding and guided tours would be available on many islands. Visitors would have access to many islands either by water shuttle or scheduled excursions. Islands served by water shuttle would have interpretive media and basic toilet facilities. Islands not on the water shuttle and served by excursions would have few amenities. On the more remote islands, visitors would see nature taking over. Activities such as picnicking, hiking, exploring historic ruins, swimming, sailing, and kayaking would be allowed in certain designated areas. Equipment for water sports could be rented, and instruction would be available at some hub islands and gateways. Some fragile islands, such as Snake, Sheep, Green, Calf, Little Calf, and Hangman, might be highly restricted to protect habitat.

EDUCATION AND INTERPRETATION

Transportation

Passenger ferries from the mainland would operate frequently in the summer. Water shuttles would go on circuits on a regular schedule several times a day among George's, Spectacle, Gallop's, Lovell's, Grape, Bumpkin, and Peddock's, and on a less frequent schedule, to several other islands where visitor programs would be available. Some islands would be reached by small craft in organized excursions: these might include Great Brewster, Rainsford, Nut, World's End, Thompson, and Little Brewster.

Visitor programs would be developed around natural and cultural resources of the islands. Programs on several islands may be designed and led by American Indians. An interpretive center would be developed on one island. Environmental education programs carried out on many islands would offer intensive learning activities for schools. Broad outreach efforts would take programs to educational institutions in the region.

Transportation

Passenger ferries from the mainland would operate frequently in the summer. Water shuttles would go on circuits several times a day to some islands, less frequently to others. The islands on the water shuttle are: George's, Spectacle, Gallop's, Lovell's, Grape, Bumpkin, Deer, Nut, Great Brewster, Rainsford, World's End, Thompson, and Little Brewster. Some remote islands may occasionally be visited by small craft in organized excursions.

Visitor programs would emphasize participatory activities for visitors based on the island environment but not always tied to island resources. American Indian culture would be experienced through different programs on many islands. Programs on several islands may be designed and led by American Indians. There would also be large-scale events such as pageants of Civil War encampments, sound-and-light shows, theatre, and concerts. Facilities with contemporary uses on the islands, such as the wastewater treatment plant, would have visitor interpretive programs.

Transportation

Passenger ferries from the mainland would operate frequently in the summer. Water shuttles would go on circuits several times a day to some islands, less frequently to others. The islands on the water shuttle are: George's, Spectacle, Gallop's, Lovell's, Grape, Bumpkin, Deer, Nut, Great Brewster, Rainsford, World's End, Thompson, and Little Brewster. Some remote islands may occasionally be visited by small craft in organized excursions.

Visitor programs would be developed around natural and cultural resources of the islands. Programs about American Indian culture would take place on many islands, several designed and led by Native Americans. An interpretive center would be developed on one island. Environmental education programs carried out on several islands and on harbor waters would be based at an environmental education center on one island. On several islands interpretation could focus on contemporary uses on the islands, such as the wastewater treatment facilities. There would also be events such as pageants of Civil War encampments, sound-and-light shows, theatre, and concerts.

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A** **Potential Facility and Infrastructure Changes**

Improvements to facilities would emphasize the protection of park resources. Major facilities would be concentrated on two islands, George's and Spectacle (see Appendix). Minimal facilities would be developed on islands in the natural resources management areas. Some possible changes if this alternative were chosen would be a redesigned entrance at George's, with rehabilitation of the visitor center and the historic landscape; restoration of selected missing features of Fort Warren; restoration of landscapes on portions of several islands; adaptive re-use of several buildings of Fort Andrews; and installation of boardwalks in portions of salt marshes.

Capital Costs

It is estimated that upwards of \$61 million would be needed to implement Alternative A on the islands, and gateway development could range from \$4 million to \$20 million, depending on how many mainland locations are developed over time.

A special initiative to be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island could cost upwards to \$16 million. (See Appendix 12.)

It is anticipated that studies and research would require expenditures of approximately \$4 million.

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B** **Potential Facility and Infrastructure Changes**

Improvements to facilities would emphasize activities for visitors. There would be major visitor facilities and services on five islands: George's, Spectacle, Peddock's, Long, and Deer. These would be developed as attractions and could have elements not specifically related to the resources of the Boston Harbor Islands. Peddock's might be a major visitor destination, with a rehabilitated and adaptively re-used Fort Andrews providing lodgings, restaurants, and shops. Long Island could have a new pier, a small visitor center, exterior exhibits at Fort Strong, beach facilities, and bicycle paths. Deer Island would have a small visitor center with exhibits. The visitor center on Spectacle would be the largest and would feature an "attraction" such as a multimedia presentation.

Capital Costs

It is estimated that upwards of \$88 million would be needed to implement Alternative B on the islands, and gateway development could range from \$4 million to \$20 million, depending on how many mainland locations are developed over time.

A special initiative to be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island could cost upwards to \$57 million. (See Appendix 12.)

It is anticipated that studies and research would require expenditures of approximately \$4 million.

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C** **Potential Facility and Infrastructure Changes**

Improvements to facilities would emphasize resource protection throughout the park with the accommodation of visitors in concentrated areas of the park. The hub islands—George's, Spectacle, Peddock's, Long, and Deer—although they would have ferry terminals, may not have equally frequent service or the same level of infrastructure development. Peddock's might have a rehabilitated and adaptively re-used Fort Andrews housing a retreat center, with food service also for day visitors. George's would have a redesigned pier entrance area, with rehabilitation of the visitor center and the historic landscape, and restoration of selected missing features of Fort Warren. Long Island could have a new pier, a small visitor contact station, exterior exhibits at Fort Strong, and beach facilities. Deer Island would have a small visitor center with exhibits

Capital Costs

It is estimated that upwards of \$79 million would be needed to implement Alternative C on the islands, and gateway development could range from \$4 million to \$20 million, depending on how many mainland locations are developed over time.

A special initiative to be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island could cost upwards to \$56 million. (See Appendix 12.)

It is anticipated that studies and research would require expenditures of approximately \$4 million.

Operating costs

Alternative A would cost approximately \$8 million. The application of funds would emphasize resource protection.

Operating costs

Alternative B would cost approximately \$8 million. The application of funds would emphasize visitor activities and programs.

Operating costs

Same as Alternative A.

¹ “The Partnership congratulates the Planning Committee and the Advisory Council on their extensive work and accomplishments in bringing together a strong consensus around a preferred alternative for the Draft General Management Plan, and it supports the key features that have been presented in Alternative C. Therefore, it is the sense of the Partnership that Alternative C be endorsed as the Preferred Alternative to be presented to the public in the Draft General Management Plan and Draft Environmental Impact Statement, with the clear understanding that the Partnership will not adopt a proposal for action in the final EIS until after it has consulted further with the general public and Advisory Council, held consultation with the Federally Recognized Indian Tribes, and received input from any other appropriate interested parties.”

ALTERNATIVE A

Key Features

- A national park area where visitors discover natural and cultural resources.
- Focus is on a setting that attracts visitors to explore nature and history. Many people and much activity are concentrated on larger islands, but there are ample opportunities to escape crowds, enjoy nature, and explore historic sites.
- Frequent ferry and water shuttle service to some larger islands. Other islands have no docks, but may be explored with small craft.
- Two hub islands: George's and Spectacle Islands are developed.
- Visitor programs developed around the natural and cultural resources of the islands with environmental education programs and intensive learning activities on many islands.
- Facilities and attractions relate to park resources and are developed on appropriate islands for people to enjoy nature and history.
- Overnight stays in improved and primitive campsites.
- In balancing resource protection with visitor enjoyment, the emphasis is on resources.

Legend

- Visitor Services and Park Facilities
- Historic Preservation Emphasis
- Managed Landscapes Emphasis
- Natural Features Emphasis
- Special Use Emphasis
- Potential Mainland Gateway Area





ALTERNATIVE B

Key Features

- A national park area where visitors enjoy varied recreational activities
- Focus is on a "people place" that attracts visitors to range of outdoor activities. Many people and much activity dispersed throughout most islands
- Frequent ferry and water shuttle service to many islands, including the Brewsters
- Five hub islands are developed: on George's, Spectacle, Peddock's, Deer, and Long islands
- Visitor programs include entertainment (light shows, concerts, etc.), and emphasize participatory activities, but all tied to the resources
- Facilities and attractions are not necessarily related directly to park resources, but developed primarily to draw people to many islands
- Overnight stays in lodging facilities and at improved and primitive campsites
- In balancing resource protection with visitor enjoyment, the emphasis is on recreation

Legend

- Visitor Services and Park Facilities (Red circle)
- Historic Preservation Emphasis (Orange circle)
- Managed Landscapes Emphasis (Green circle)
- Natural Features Emphasis (Dark Green circle)
- Special Use Emphasis (Purple circle)
- Potential Mainland Gateway Area (Dashed circle)



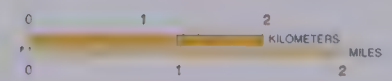
ALTERNATIVE C

Key Features

- A national park area where visitors discover natural and cultural resources and, where appropriate, enjoy varied resource-based recreation activities.
- Focus is on a setting that attracts visitors to explore nature and history. Many people and much activity concentrated on larger islands, but ample opportunities to escape crowds, enjoy nature, and explore historic sites.
- Frequent ferry service to island hubs; water shuttle service to a number of other islands. Some islands have no docks, but may be explored with small craft.
- Three main hub islands—George's, Spectacle, and Peddock's islands—are developed, and two secondary hub islands—Deer and Long islands—may be developed.
- Programs and recreation facilities developed for diverse population to enjoy nature and history. Visitor programs, rather than facilities, offer enticements to the islands.
- Facilities and attractions relate to park resources and are developed on appropriate islands for people to enjoy nature and history.
- Overnight stays at primitive and improved campsites and in lodging facilities on a few islands where appropriate.
- In balancing resource protection with visitor enjoyment, the emphasis is on resources, with recreation opportunities compatible with resource protection.

Legend

- Visitor Services and Park Facilities
- Historic Preservation Emphasis
- Managed Landscapes Emphasis
- Natural Features Emphasis
- Special Use Emphasis
- Potential Mainland Gateway Area



VIGNETTES OF
POTENTIAL
ACTIVITIES

VIGNETTES OF POTENTIAL ACTIVITIES

Since general management plans are intended to provide policy guidelines and direction for managers, they do not describe specific projects. This section contains several ideas of the types of infrastructure development and programming activities that may take place under the general management plan for the Boston Harbor Islands. The vignettes show the flavor of potential projects that could emerge over time. Decisions to implement any of these ideas would be determined by the Partnership and the agency island owners.



MAINLAND GATEWAY

From the dark subway a few steps away, visitors emerge into the sun and the wind of the mainland gateway to the harbor islands. Among the festive flags and kiosks, an electronic sign flashes the gate number for the next passenger ferry. While some vendors peddle souvenirs of the Boston Harbor Islands, others offer tours to the outer islands and coastal lighthouses. Several people duck into a provision shop on the pier for sunscreen and a last-minute snack for the voyage. It will take about 30 minutes to reach the island hub, and the salt air induces hunger.

A bus discharges its passengers, a church group from one of Boston's far-flung neighborhoods. The group unloads its picnic baskets and sets them next to the gangway, ready for the ferry's "all aboard" call. With some time to spare before the next ferry, the youngest members of the group explore a nearby park. They climb the "ratlines" of a ship-rigged jungle gym to catch a glimpse of the next ferry coming in to the gateway. A brief time remains to wander, and neighborhood youngsters mingle with international visitors who had explored Boston's Freedom Trail the day before and are now ready for a harbor trail.

Several people speaking an Asian language need directions to the boat to Salem; they have heard much

about the 18th-century China trade and want to visit the Peabody-Essex Museum and historic wharves. Choices abound: A half-day visit to one island. A full-day visit to three or four islands. A two-hour excursion around the islands with a park ranger describing the sights. Or, a coastal voyage to Salem today and to Quincy tomorrow.

BOAT EXCURSION TO THE BREWSTERS

For some people, their first Boston Harbor Island experience is a "visual visit." Passengers had to book this trip several weeks in advance, since this special boat is much in demand. The former fishing vessel, built in 1948, was modernized for the comfort of 20 passengers. It contains early navigation equipment, which the captain demonstrates. Modern telescopes mounted on deck give close-up views of nesting egrets and cormorants on Middle Brewster and basking seals on the rocks of Outer Brewster.

Passengers board this small excursion boat and motor out to the farthest islands, the Brewster islands and The Graves. A ranger aboard the boat explains the stories behind the island names. She tells the lore and history of these islands, starting with geological history of the glaciers and the drumlins created by the glaciers. For centuries before Europeans arrived, American Indians used the islands; their oral tradition suggests that the islands and surrounding waters were favored for fishing and clamming, and shell middens found on several of the islands in recent years reveal more evidence of Indians' way of life. At the Brewsters the ranger talks about some of the people of the early 20th century who occupied these far outposts – some who built summer homes on Calf Island, lobstermen, and quarry-men who took up residence for several months a year. And, there were the many military men who manned the batteries of Great Brewster, defending the coast during World War II.



For a morning's excursion, the group has gotten a view of most of the Boston Harbor Islands and gathered a verbal picture of this park and its many historical and natural resources. Next stop is the mainland gateway where passengers make plans to board the next ferry out to explore one of those islands on foot in the afternoon.

ISLAND HUB

Ferries from downtown and the North Shore and South Shore converge on Spectacle Island, one of several island transportation "hubs" that support the Boston Harbor Islands national park area. Most passengers are beach-goers escaping the heat of the urban land just a mile away. They've come primarily for a day at the beach, but before heading for the changing rooms one family stops at the visitor center to check on the exhibits and get oriented to the park. Next visit, they will take a water shuttle to explore another island, but this day they want to map out their itinerary in advance.

Inside the visitor center, they also view a short film about the park and listen to a ranger describing the sea glass on display. The collection of glass was assembled in the 1980s before the island was "rebuilt" with fill from the Central Artery. There's a small retail store selling park-related items. Another park guide is gathering a group to tour some of the experimental alternative energy projects being tested on Spectacle Island. The group is too large for each member to use an electric bicycle (powered by solar batteries), so most board electric carts and meander up the south drumlin to view windmills close at hand.



But the beach awaits, and the family walks to the changing rooms, complete with lockers and showers, and then they rent an umbrella and beach chairs. For beach-goers, this is the best beach in the area, newly replenished with sand, on the leeward side, safe for swimming, and large enough to accommodate everyone who arrives by ferry and still not seem

crowded. Spectacle Beach is still one of the better-kept secrets of Boston Harbor Islands national park area. The landscape itself is dramatic, with the highest point in the harbor, five miles of pathways, environmental artwork, and a variety of plants for erosion control and scenery. The pier with small kiosks and an adjacent marina keep this a lively place throughout the day. At night, a floating restaurant at the pier, which specializes in New England seafood, serves dinners by reservation. It's one of the "enticements" to the Boston Harbor Islands, and it also generates revenue for the park, as does the marina. This island has become a real hub of the expanded park system.



MARINA

Several islands have marinas for sailboats and small powerboats. Since a recent issue of *Sail* magazine touted the charms of the Boston Harbor Islands, the marina has been nearly full all summer.

A family of sailors arriving from Maine reserved a berth several weeks in advance. The first thing they notice on the dock is a sign welcoming them to the park. They are greeted by a dockmaster when they land, who also orients the family to the island, but recommends that they stop in at the visitor center for a real orientation. They plug into an electric outlet and hose down their vessel from its two-day coastal trip before setting out on an island hike. As they walk along the path, they begin to get a picture of this island park by the signs and artifacts on display on the way to the visitor center. A ranger greets them and leads them to a group that is just setting out to explore the old fort. After the ranger-led walk they return to the cafe, next to the marina for a late-afternoon snack. They will have dinner in a restored building of the old fort.

Meanwhile, in a berth adjacent to the family is a Viking longboat-like "pulling boat" outfitted with three sets of oars and occupied by half a dozen rugged-looking youth who appear to be camping out in their unusual craft. The family of sailors meets the "Vikings"

and learns that they live across the bay in Boston and have been doing an Outward Bound program at nearby Thompson Island. Their challenge this week has been to be fully self-sufficient living on their boat with only a single land stop – at this marina. The stopover is designed for the crew to present a planned interpretive program for other park visitors about island life and survival skills. Clearly these urban teenagers have met the week's survival challenge and leave their audience impressed with their outdoor skills.

The sailing family from Maine spends a second day on the island in order to explore the more remote and undeveloped west side of the island. They join a group that has just come over by ferry for the day. Their stopover at the Boston Harbor Islands marina turns out to have been more interesting than most marinas. It had rangers, exhibits, and a diverse group of people, all of whom seemed to find interesting adventures.

KAYAK RENTALS

Of several modes of visiting the Boston Harbor Islands – ferry, excursion cruise, small powerboat, sailboat, or kayak – the kayak trip may require the most forethought and planning. Typically, reservations are required several days in advance. At or near the gateways, rental shops are equipped with all manner of contemporary gear, instruction for a safe outing, and education in the natural history of the islands and concepts of island stewardship. Day-trippers learn some natural history of the islands from a knowledgeable kayak guide.

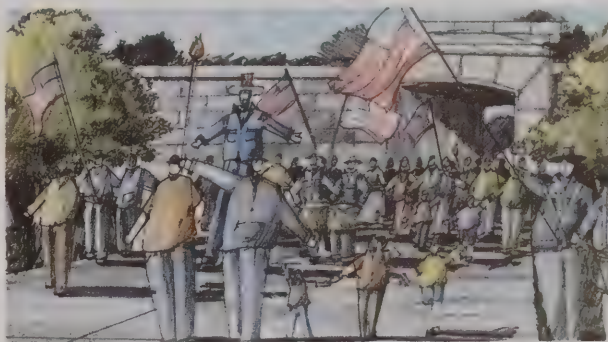
The kayak kiosk is a seasonal tent complex, erected each spring. It includes changing rooms, restrooms, equipment displays, and racks for kayaks, wetsuits, and life preservers. The renter's package includes a full complement of equipment, a short training session on kayak safety, an experienced guide, and a day of kayaking.



Being in an active, working harbor with greatly varying water depths, changeable currents, tides, and wakes from large vessels, the private kayak outfitters require renters to be accompanied by a guide for safety reasons, unless they can meet requirements set by the park and the kayak rental concessionaires. Qualified kayakers can make up their own itinerary among the islands through established water trails marked either with buoys or on a waterproof paper map available at the rental kiosk. The water trails are carefully planned to avoid major shipping channels. When paddlers beach their crafts to explore the islands, they do so knowing the places of least impact on the island.

Kayak rental outfitters are small businesses selected by the Boston Harbor Islands Partnership to provide this service to park visitors. The rental fees schedule is approved by the Partnership, and a percentage of the profits go back into the park's special fund for resource protection.

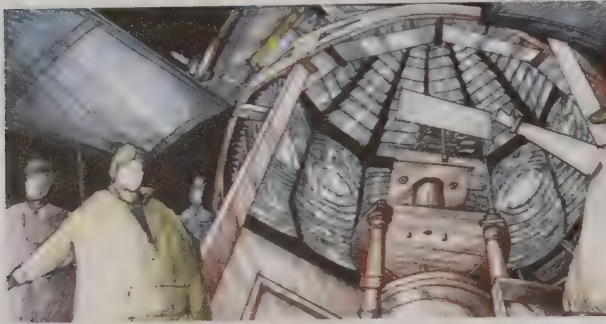
HISTORICAL PAGEANT



An early-evening boat takes visitors to George's Island for a pageant of history and entertainment for this twice-weekly event. On the boat, performers play music, juggle, and tell stories, while costumed actors speak "in character." Visitors disembark onto a festively decorated pier, and make their way to the dining area where a New England clambake begins. Diners watch the sun set while listening to roving musicians. As the sun sets, the crowd is ushered into the granite fort to witness a 19th-century "musicale" featuring a small ensemble of string instruments accompanied by singers performing Civil War-era songs and dance numbers. As darkness descends, the theatrical pageant begins, the dramatic history of Boston Harbor and its islands unfolds. The pageant depicts the broad themes of history accurately with charm and humor. Children and adults alike enjoy the

remarkable march through time. Throughout the presentation, multiple photo-collage slide projections illuminate the fort background with historical images and dramatic lighting. Giant puppets and a lively soundtrack add to the spectacle. The pageant concludes in dramatic fashion with sounds of cannon fire, exploding mines, marching soldiers. Delighted and exhilarated, the crowd is guided back to the ferry for the 45-minute trip back to the mainland.

LIGHTHOUSE TOUR



A water shuttle drops a group of 15 visitors off at Little Brewster Island. After disembarking on the new floating pier, the group is met by a uniformed member of the U.S. Coast Guard and a park ranger, who are serving as tour guides. This two-acre island of bedrock is the home of Boston Light (1716), site of the first lighthouse built in the United States, and the last to remain staffed. After introductory remarks by the guide, the group walks along the pier, past a boathouse on the left and to the keeper's house. A generator shed has been converted to a museum, where a visitor can get a close-up look at lighthouse artifacts, such as a Fresnel lens, several types of foghorns, and historic photos of the keepers' families who lived on Little Brewster in the past.

Visitors learn about the life of a lighthouse keeper and imagine how a child growing up here would have seen the world. After leaving the house, visitors stroll along the walkway to the lighthouse. It stands 102 feet tall, intact after more than 200 years, and recently refurbished. The tour guide asks which members of the group are prepared and able to make the somewhat rigorous climb to view the lens close-up. Only five visitors are allowed at one time, and flat shoes and good physical condition are necessary prerequisites. It is a narrow spiral metal staircase with two small ladders near the top. And then, standing near the top—between the huge second-order Fresnel lens and a wall of glass—they take in one of the most spectacular views in Boston.

The Coast Guard guide explains the keeper's duties

and the mechanics of maintaining the light. The first group returns to the base to get to know Sam, the lighthouse dog, while another group makes the climb.

After about an hour on Little Brewster, the group walks back to the pier to board the excursion boat for the return trip to downtown Boston. Sam and his master for the day bid farewell and wait for another excursion to arrive in the afternoon.

CONFERENCE CENTER

From the shell of an old fort, a conference center complex has been created for groups and individuals seeking an island getaway close to home. They come for meetings and retreats from urban life, and they come partly because they know that this development is constantly seeking better techniques for making use of the Earth's materials with minimal depletion; "sustainable technology" is the shorthand. The rehabilitated structures contain modern amenities with emphasis on renewable technology. Solar power supplies more than half of the energy needs, graywater is recycled for a native plant nursery, and a range of waste disposal methods is being tried. Conference participants have come to expect moderate comfort, yet are willing to take part in experiments that will inform us all of better ways to avoid misusing our resources.

Visitors have come to see the conference center as a recreational village with themes of American Indian culture, island environmental studies, and marine science and technology. A portion of the "village" is an artists' colony offering a retreat for quiet work. There is a range of accommodations—from a youth hostel and a bed-and-breakfast inn, to full-service conference center facilities. From downtown Boston, a ferry trip takes 45 minutes and brings day-trippers along with overnight visitors. The center is fully active in three seasons, and even operates through the winter at a low level.



HISTORIC FORT PROGRAMS

After disembarking at the island pier, visitors are greeted by a uniformed guide who provides a brief orientation and then leads the visitors through the fort, giving them a history of the fort. She is a retired Navy lieutenant who volunteers on this island and brings some of her military experience into her narrative. She points out the functions of individual buildings and structures. Next to many of the buildings and structures are signs with historical photos showing a much different view than the one seen today. The fort was used during the major wars of the past century until World War II when it housed nearly 1,000 military personnel, including prisoners of war. Without the historical photos, one has difficulty visualizing the large gun emplacements, which were formerly located in now empty tracks.

Visitors then enter a small exhibit room of the fort where more photos of the structure and the soldiers who lived and worked within are displayed. Along with the historical photos are poster-size excerpts from soldiers' journals or diaries. Playing in the background is period music from the heyday of the fort, interspersed with actors reading excerpts from the soldier's journals. A large map of the island shows the location of the fort and the island in relation to other island defenses. A final exhibit involves craftsmen working with period tools to demonstrate construction techniques used in building this fort. Although most visitors have no first-hand experience of military life, the exhibits intrigue them and prompt them to investigate the full range of Boston Harbor fortifications that can be seen on the islands.



CAMPGROUND



The ferry from the South Shore is filled with campers and their gear. One group of four young women has extended their visits for the Hull High School 10th reunion to camp on an island offshore from their childhood homes. They are amazed at the diversity of the campers they meet on the Boston Harbor Islands – a couple from Sweden, a family with three young children from Oregon, a boy scout troop from New Hampshire, and many people from neighborhoods of Boston.

Campsites are scattered in three areas of the island, all nestled next at the edge of trees and a field, on gently sloping ground. Amenities are minimal – a tent platform, potable water, vault toilets, a stone cooking grill for each site. People expect to rough it and usually come for two or three days at a time.

The young women from Hull chat about their high school days, when the islands had only a few campsites, and getting here took considerable planning. This time it was easy – many more islands to choose from, inexpensive reservations via internet, a short hop to the ferry pier where boats were constantly departing and arriving, and equipment rentals right at the pier.

From this campsite, there's a spectacular view of the ocean beyond three other islands. When the day visitors leave the island, a ranger comes round to invite the overnights to a campfire program. There will be ghost stories drawn from these islands – a specialty of one summer ranger who otherwise is a drama teacher in a midwestern college. The program is a hit with the campers, who despite ghoulish tales, feel secure and safe on the island as they make their way back to their campsites. The night sky is exceptionally clear and the families from Boston remark on how rare it is to see such darkness.

ENVIRONMENTAL LEARNING VESSEL

A science program developed for students has turned into one of the most popular activities for visitors in general, and two new vessels have recently been added to the "fleet." Twice a day passengers board this laboratory boat to troll the harbor. They take water measurements, analyze data, and draw in samples from the benthic layer, or the harbor floor. Science experiments are far from dull on this vessel. The program covers water quality, meteorology, navigation, and marine biology, although each excursion may focus on just one of these areas. Instructors are graduate students from the one of the many universities in Greater Boston.

Some of the passengers volunteer to put on fishermen's attire to help spread and haul the net. Others remain dry inside the cabin. The haul on this trip includes half a dozen skates, two small crabs, plenty of varieties of seaweed, and some harbor muck. Each find gets examined, its role in the ecosystem explained, the bottom muck tested for metal content, and the living creatures shortly returned to the water. Meanwhile another group of passengers drops thermometers and records water temperatures at various depths. Salinity and clarity of the water are also tested.

When all the experiments are run and results recorded, the boat motors over to its island base to deliver the data. Passengers debark for a brief tour of the island laboratory, which is the headquarters for environmental monitoring in the harbor and on the islands. The captain signals her departure and starts the final part of the program, the use of navigational instruments. Today's excursion group not only gets to view the boat's radar and new global positioning device, but is present for an extended ship-to-shore conversation with a tugboat bringing a tanker of liquefied natural gas to Chelsea. Back at the gateway pier, passengers are thanked for their work, and reminded that the Boston Harbor Islands website is the place to check to keep up with environmental monitoring.



DRAFT
ENVIRONMENTAL
IMPACT
STATEMENT

I N T R O D U C T I O N

The first section of the Draft Environmental Impact Statement (DEIS), Affected Environment, describes the current state of the natural environment, the cultural environment, and the socioeconomic environment of the Boston Harbor Islands. The next section contains a summary of the management alternatives, and a summary of environmental impacts on the resources, the public, and the socioeconomic environments. The DEIS is concluded with a section on consultation, public involvement, and compliance with other related laws.

The Draft GMP and DEIS will be available for public review for 60 days. Following public review a proposed plan will be prepared by the Partnership, and the final draft GMP and final EIS will be published. Following a 30-day period, the plan will be submitted to the Governor of Massachusetts. Then a record of decision will be prepared by the National Park Service Northeast Regional Director for the Secretary of the Interior.

During review periods the National Park Service will accept written and oral comments. The Partnership will carefully review all comments and incorporate them, as appropriate, in the final plan and final impact statement. The National Park Service may make public any written comments it receives on the plan, including the names and home addresses of respondents; these comments may be inspected during regular business hours. Individual respondents may request that NPS withhold their home address from the planning record, which will be honored to the extent allowable by law. There also may be circumstances in which NPS would withhold from the planning record a respondent's identity, as allowable by law. If anyone wishes to have his or her name and/or address withheld, he or she must state this prominently at the beginning of the comment. The National Park Service does not consider anonymous comments. For all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, the National Park Service will make the submissions available for public inspection in their entirety. A copy of the draft general management plan and a response form will be posted on the World Wide Web at nps.gov/BOHA/admin.

Comments should be submitted to:

George Price, Project Manager
Boston Harbor Islands National Park Area
408 Atlantic Avenue, Suite 228
Boston, Massachusetts 02110

For further information, please contact the project manager at (617) 223-8666.

The alternative management proposals presented in the Draft GMP establish concepts for possible future directions for managing the Boston Harbor Islands national park area, consistent with National Park Service policies. Because the alternatives are general policy directives, the impact analysis in the draft environmental impact statement is also general. In keeping with the requirement of National Environmental Policy Act (NEPA) to evaluate site-specific impacts before "breaking ground," future impact analysis and public involvement will occur before physical development takes place. The general management plan will have narrowed the range of choices in subsequent development plan analysis to those that explore how and where to site facilities within a designated geographic management area. This is known as "tiering," and it allows the managers "to focus on the issues that are ripe for decision and to exclude from consideration issues already decided or not yet ripe," according to NPS policy (Director's Order 12).

Potential futures described in the alternatives have been arrived at, in large part, by consensus among many diverse agencies and institutions, which together operate as the Boston Harbor Islands Partnership. The melding of these agencies and the consensus-building process will continue and will produce priorities for implementation proposals in the future.

Basic to the alternatives is a set of geographic management areas each describing a range for future resource conditions and future visitor experiences. Infrastructure development and relative level of visitor use allowed within each geographic management area provide the starting point for predicting the impacts contained in the DEIS. Those impacts are based on the highest allowance in each management area.

The alternatives presented in the draft general management plan make clear that adoption of the plan will not result in changes to the resources so much as it will set the direction for future management decisions. Future implementation plans will cover: resource management, trail management, interpretation, visitor use management, comprehensive identity and signage, land protection, fire management, hazardous materials survey, integrated pest management, invasive plants management, vegetation restoration, collections management, archeological resources management, wetland and floodplain protection, shoreline and sea wall management, land and water transportation, commercial services, and public safety. See Appendix 10 for a complete list of future plans and studies.

A F F E C T E D E N V I R O N M E N T

This section describes the natural, cultural, and socioeconomic environments of the Boston Harbor Islands, some of which may be affected by implementing the alternatives. For a description of the alternatives, see page 50 of the draft general management plan.

NATURAL ENVIRONMENT

CLIMATE

Located at 42 degrees north latitude, the Boston Harbor Islands have a humid maritime climate characterized by a moderate annual range of temperatures and definite summer and winter seasons. The islands receive approximately 40 inches of precipitation annually, relatively evenly distributed throughout the year. Typically over the course of a year, there are 100 clear days, 106 days of partly cloudy weather, and 159 days of cloudy weather, with no distinct seasonal patterns. Fog occurs, on average, about two days every month.

The climate of the islands offers a particular attraction when hot, humid weather dominates the region. The modulating effect of surrounding waters typically produces significantly cooler temperatures in contrast with the city and its suburbs. Inversely, winter temperatures on the islands are warmer than those of mainland sites.

The frost-free period on the islands generally lasts from mid-May to November. Snow falls regularly between January and April, but warm air coming off the ocean causes it to melt soon after most storms. Summer air temperatures average in the 60s or above, with highs reaching into the 90s, only occasionally clearing the 100 mark. In winter, temperatures in the 20s are common, and lows can reach near zero. Harbor water temperatures range from an average of 39 degrees Fahrenheit in the winter to 68 degrees Fahrenheit in the summer.

Prevailing winds in the harbor generally move from the northwest in winter and the southwest in summer. Mean wind speed is between 11 to 12 miles per hour during the summer months, and between 14 to 15 miles per hour during winter months. The hurricane season typically begins early in September and extends into October. "Northeasters," severe coastal storms unique to this area of North America, evolve from marine cyclones that build up southeast of New England. The winds circulate counterclockwise

and pull wind and water out of the northeast, bringing high waves and heavy rain or snow. These and other storms cause erosion to many islands. This is both part of an acceptable natural process and a maintenance/management concern (loss of island area, damage to erosion control structures, safety concerns, loss of historic structures and archeological resources).

AIR RESOURCES

The purpose of the Clean Air Act (42 USC 7401 et seq.) is to protect and enhance the nation's air quality. States are responsible for the attainment and maintenance of national ambient air quality standards (NAAQS) developed by the Environmental Protection Agency (EPA). These standards have been established for several pollutants: inhalable particulate matter (PM-10), sulfur dioxide, nitrogen oxides, ozone, carbon monoxide, and lead. Elevated concentration of these pollutants can have adverse impacts on island resources and visitors.

Three air quality categories are established for national park system areas: class I, class II, and class III. The Boston Harbor Islands are in a class II area. The state may permit a moderate amount of new air pollution (sulfur dioxide, particulate matter, and nitrogen oxides) as long as neither national ambient air quality standards nor the maximum allowable increases (increments) over established baseline concentrations are exceeded.

The islands are part of the Boston Metropolitan Air Quality Region within which there are several large stationary and mobile sources of contaminants, including Mystic and Salem Generating Stations. Air quality in this region is also affected by air pollution transported into the region. The Boston Metropolitan Air Quality Region does not meet EPA standards for ozone or carbon monoxide. The major pollutants originating from the park are boat emissions (primary hydrocarbons, carbon monoxide, nitrogen oxides) and particulates, most of which are generated during the summer months.

A variety of particulates (salt from seawater, diatoms and other plankton, silt and clay particles from erosion and wave action) are produced as part of natural processes in the marine environment. Minor additional amounts of particulates are produced by human activities on the islands.

No monitoring of air quality or visibility is

conducted at the park, and there is no assessment of air quality–related impacts on island resources. The state Department of Environmental Protection monitors air quality in the region. The National Park Service does monitor ozone and acid deposition at Cape Cod National Seashore 60 miles to the southeast of Boston.

In 1993, the National Park Service developed a strategy to initiate actions that preserve and protect air resources in park units east of the Mississippi. Known as CLEAR (A Clearer Look at Eastern Air Resources), this program emphasizes cooperative efforts between the National Park Service, the public, and federal, state, and local agencies to minimize air pollution's impacts on natural and cultural resources, to protect the health of park visitors and employees, and to enhance visitor enjoyment, while taking a leadership role in reducing or eliminating sources within the park.

GEOLOGY AND COASTAL PROCESSES

Boston Harbor is part of the Boston Basin, a geological feature created by a shift in the Earth's crust millions of years before the glaciers. In the past 100,000 years, two separate periods of glaciation formed the hills that became the islands of Boston Basin and created the local drainage system, consisting of the Charles, Mystic, and Neponset watersheds. The cores of many harbor islands are drumlins—glacier-formed, asymmetrical, elongate masses of till formed into smooth-sloped hills on the Boston Basin lowlands. In profile, they look like upside-down teaspoons. As the climate warmed and the glacier receded from the Boston area some 15,000 years ago, the melting of glacial ice raised the level of the ocean, eventually creating this section of the basin and isolating the islands. Although most of the islands have one or more drumlins, many of the Brewsters and several Hingham Harbor islands are bedrock outcroppings.

Drumlins may occur as scattered single hills, or in so-called swarms. The Boston Harbor Islands are a geological rarity, part of the only drumlin swarm in the United States that intersects a coastline. This “drowned” cluster of about 30 of more than 200 drumlins in the Boston Basin are not all elongate in shape, as most other drumlins are. While nearly all drumlins were molded in the direction of glacial flow (their steeper slopes facing the glacier's point of origin), the general northwest-to-southeast orientation of these drowned drumlins varies widely, diverging as much as 70 degrees from each other. By definition

drumlins are formed by the direction of glacial flow, and the direction of flow can vary within one glacier as the ice pushes over and around obstacles. It is likely that some of the drumlins were reworked to some degree during the time of glacial retreat when outflow from glacial rivers was high. Geologists believe the islands illustrate two separate periods of glacial action. Most of the harbor islands are composed of two layers of glacial till, their bases laid down by glacial expansion during the early Pleistocene Era, when sea level was 20 meters lower than it is now, and their upper parts deposited when the ice retreated many thousands of years later, some 16,000 years ago. The lower till of some of the island drumlins has preserved delicate fossils that are not found in the upper layers. About a dozen of the islands are not drumlins, but outcrops of bedrock generally composed of Cambridge and Braintree Argellite. Their shape and size were molded by glacial erosion; moving glacial ice removed preglacial soils and ground down surface material to expose the bedrock, which was polished by ice flow.

Natural coastal processes, especially northeast storms, continue to reshape the island landforms. Rates of erosion on the islands can be dramatic. In general, the highest rates of beach erosion occur along beaches facing north and east, which are the dominant directions for winds and seas in these storms. The shifting shores of Thompson Island illustrate this process of erosion and sedimentation. Human use of the islands also affects shoreline processes. Removal of or damaging of vegetative cover can promote erosion, whereas structures can be built to prevent erosion. General NPS policy is to let the shoreline processes take place unimpeded:

Natural shoreline processes...that are not influenced by human actions will be allowed to continue without abatement except where control measures are required by law. In instances where human activities or structures have altered the nature or rate of shoreline processes, the National Park Service will, in consultation with appropriate state and federal agencies, investigate alternatives for mitigating the effects of such activities or structures. The National Park Service will comply with provisions of state coastal zone management plans prepared under the Coastal Zone Management Act (16 USC 1451 et seq.) when such provisions are more environmentally restrictive than National Park Service management zoning. (NPS Management Policies, 1988)

There are many erosion control structures within the Boston Harbor Islands. These structures can significantly affect the rate of erosion and the movement and transport of sediments in the harbor and on the islands. Careful study and consultation will be required in the future to appropriately reconcile NPS policy with the need to protect shoreline assets. In 1978, Massachusetts adopted policies concerning the protection, development, and revitalization of coastal resources within the state. All lands on the islands, except federal lands, are subject to Massachusetts coastal zone management policies; all federal activities related to marine resources must be consistent with these policies.

In general, the geographic history of the islands can be summarized as, first, glacial shaping of landforms with a new northwest–southeast orientation; second, sea level rise after glacial retreat, which partly immersed the glacial hills to form islands, with erosion and deposition reorienting the islands to a northeast–to–southwest bearing; and third, human intervention, leading to greater local erosion control needs.

WATER RESOURCES

Boston Harbor

Boston Harbor is located in Massachusetts Bay, itself part of the Gulf of Maine. Massachusetts and Cape Cod bays stretch between Cape Ann in the north and Plymouth in the south and eastward to a boundary marked by Stellwagen Bank National Marine Sanctuary. Together they encompass approximately 1,400 square miles; Massachusetts Bay itself embraces 800 square miles.

East of the Boston Harbor Islands, Stellwagen Bank is a glacially deposited, submerged sand bank that forms critical feeding and breeding grounds for endangered marine species. The National Marine Sanctuary was designated by Congress in 1992 to protect and conserve the fragile ecosystem that the bank supports. It protects the feeding areas of migrating cetaceans (including Atlantic white-sided dolphins, harbor porpoises, and orca, pilot, and minke whales) and the nursery and feeding grounds of humpback, fin, and Northern right whales. Stellwagen is one of only 14 such sanctuaries in the United States.

In 1990, Massachusetts Bay was named an Estuary of National Significance, one of 21 in the nation. The designation made possible the allocation of a five-year, \$5 million grant under the Clean Water Act for research, the development of a management

plan for the bay, and public education and outreach. Founded in 1988, the Massachusetts Bays Program works with 49 coastal towns and 119 inland communities in Massachusetts and New Hampshire to enhance the natural and scenic resources of the bays along this coastline, improve water access, and protect public health.

Boston Harbor is divided into the Inner and Outer harbors. The Inner Harbor lies north and west of a line drawn between Logan Airport and Castle Island. It includes the mouths of the Charles and Mystic rivers and the port of Boston. The Outer Harbor includes the three bays of Dorchester, Quincy, and Hingham. The borders of the bays are formed by the mainland shoreline and various island groupings. The two harbors combined comprise approximately 50 square miles and are bounded by 180 miles of shoreline. Within the harbor are the park's some 30 islands and peninsulas, totaling approximately 1,600 acres. To illustrate the size of the harbor, the distance from Boston Common to the Outer Brewsters is the same as that from the Common to the junction of the Massachusetts Turnpike and Route 128, approximately 11 miles.

The natural watershed around Boston Harbor extends as far west as Hopkinton, Massachusetts, 25 miles inland. The farthest point from which water enters the harbor is the Quabbin Reservoir about 65 miles to the west, which supplies water to Boston and more than 100 surrounding communities.

Most of the harbor varies in depth from about 3 to 30 feet, but the north and south ship channels, between the airport and Spectacle Island and between George's Island and Hull, can reach depths of 60 feet.

Tides and Currents

Boston Harbor, with a tidal range of 9½ to 10 feet, is one of the largest tidal ranges in the United States. Tidal currents within Boston Harbor vary greatly in speed because of the irregular bottom topography and the large number of islands; the highest speeds are found at the deepest levels, and the slowest speeds are found in shallow areas. Boston Harbor has a relatively slow “flushing” rate in which about one-third of the water is “replaced” during each tide cycle. Water quality is affected by flushing rates.

WATER QUALITY

By the mid-1980s, Boston Harbor showed the effects of decades of sewage and sludge discharges,

undersized and poorly maintained treatment plants, and shoreline sewage overflows in rainstorms. Beaches were frequently closed, areas of the harbor were brown with sludge sticks, and large sections of the harbor floor were virtually devoid of life. The harbor's flounder were infamous for extraordinarily high rates of liver disease and also suffered from fin rot.

Today, Boston is approaching the completion of a \$4 billion court-ordered cleanup project by the Massachusetts Water Resources Authority, including the elimination of sludge discharge, secondary sewage treatment, and containment of combined sewer overflows. Sewage from 43 municipalities undergoes primary treatment at Deer Island, where sludge is removed (and made into fertilizer when possible) and where the remaining liquid is disinfected with chlorine and soon will be released from a nine-mile-long pipe extending east of Deer Island into Massachusetts Bay. Five thousand five hundred industries and two to three million people contribute their waste to this sewage treatment system.

Elimination of the discharge of sewage sludge to the harbor, improved sewage treatment, and pollution source controls have significantly reduced contaminant loads to the harbor. The water quality in Boston Harbor dramatically improved after 1991 when sludge was no longer dumped into the harbor. Beach closings have decreased by 50 percent since 1990, dissolved oxygen is up (the frequency and severity of anoxia has decreased), and wildlife is returning to the harbor. Overflows from combined sewers are reduced by 70 percent and still declining, and virtually all wastewater receives secondary treatment. Swimmers' advisories are down, water clarity has increased, flounder liver disease is only 30 percent, and biodiversity of the sea-floor communities has rebounded, especially in the areas formerly affected by sludge.

While the wastewater treatment facilities address most of the problem, some waste is being discharged by boaters who illegally pump-out human waste directly into the harbor and by industries that discharge treated waste into the harbor.

As is typical of many coastal areas near major metropolitan centers that have been used for waste disposal since Colonial times, Boston Harbor contains contaminants that have accumulated in the sediments of the bay. Toxic contaminants in the sewage can be divided into two major classes of metals and organic compounds. The Environmental Protection Agency has developed a list of about 100 "priority pollutants."

On average about 550 pounds of metals and 150 pounds of organic "priority pollutants" are discharged to the harbor in the 360 million gallons per day of primary-treated waste water. In declining order of abundance, zinc, copper, and lead are the most prevalent metals, while phthalates, chlorinated methanes, and ethylenes and toluene are the most common organics. A study of the sources of toxicity in Massachusetts Water Resources Authority's effluent found that most of the toxicity is caused by surfactants—the material used to increase the cleansing power of detergents.

The level of some organic contaminants, including polychlorinated biphenyls (PCBs), accumulating in the sediments within Boston Harbor has been greatly reduced because the waste stream for these substances has been slowed to a trickle. Other toxins, especially heavy metals, oil, and boat paint, continue to accumulate. Nonvolatile contaminants including PCBs, heavy metals, and some components of boat paint bind strongly to the organic muds that accumulate in the harbor so that they typically have high levels of impact primarily on benthic (bottom-dwelling) organisms and the animals that feed on them.

Disease-causing organisms, such as bacteria (indicated by fecal coliform and other pathogenic bacteria), and viruses from organic and human waste and excess nutrients, such as fertilizers, are also part of the pollution that affects Boston Harbor. Households and streets are the major sources of certain contaminants, such as toxins and fecal coliform bacteria. Industry is no longer the major contributor in terms of volume of pollutants.

In recognition of the improved water quality, the governor and the mayor of Boston appointed a Joint Commission on the Future of Boston Harbor Beaches to recommend a restoration plan for the waterfront and island beaches. The Commission's plan was funded in 1994 by \$30 million from the state legislature along with a \$500,000 challenge grant issued by the mayor. It is a five-to-seven-year plan for improvements that range from green space enhancements, bathhouse restoration, beach nourishment, and enhanced public transportation, to increased public access to the beaches.

SOILS

The soils of the Boston Harbor Islands have been classified into three major types: Hinckley-Merrimac-Urban Land; Canton-Charlton-Hollis; and Newport-Urban Land.

The Hinckley-Merrimac-Urban Land soils (found on the southwestern end of Thompson) are very deep, nearly level to steep, excessively drained soils formed in sandy and loamy glacial outwash overlying stratified sand and gravel, and areas of urban land. These soils are usually found in major stream valleys and on coastal plains.

The Canton-Charlton-Hollis soils (found on Outer and Middle Brewster, Calf, and George's) are very deep and shallow, gently sloping to steep, somewhat excessively drained and well drained, loamy soils formed in glacial till and in ice-contact, stratified drift. These soils are generally found on uplands and low hills.

The Newport-Urban Land soils (found on Long, Deer, Spectacle, Lovell's, Gallop's, Great Brewster, Grape, and Slate) are very deep, gently sloping to moderately steep, well-drained soils formed in friable, loamy glacial till overlying a firm substratum, and areas of urban land. These soils are generally found on steep hillsides in the Boston Basin.

The above soils are all excessively well drained to well drained soils (i.e., exclusively upland soils). There is also a range of wetland and intermediate soils on the islands as well as beach sands and mudflat muds.

Prime and Unique Farmlands

The U.S. Department of Agriculture defines prime farmland as the land that is best suited for food, feed, forage, fiber, and oilseed crops; unique farmland produces specialty crops such as fruit, vegetables, and nuts. According to an August 11, 1980, memorandum from the Council on Environmental Quality, federal agencies must assess the effects of their actions on soils classified by the Soil Conservation Service as prime or unique. Five soils classified as prime or unique farmland types occur within Boston Harbor Islands: Canton fine sandy loam, Merrimac fine sandy loam, Newport silt loam, Pittstown silt loam, and Sudbury fine sandy loam.

There are no historically farmed areas still in active agricultural use. Of the islands within the park, Thompson has the greatest percentage and variety of prime agricultural soils. About three-quarters of the island is composed of a patchwork of all five prime agricultural soil types. About two-thirds of Long Island and about half of Grape Island are covered with both Newport silt loam and Pittstown silt loam. Small portions of Gallop's, Lovell's, and Great Brewster are covered with Newport silt loam.

As of September 1989 (Natural Resources Conservation Service's soil survey date) about one-

third of Deer Island was composed of Pittstown silt loam, and about one-third of Spectacle Island was composed of Newport silt loam. The construction of the sewage treatment plant on Deer Island and the deposit of fill on Spectacle Island have since dramatically altered the soil content on those islands.

Groundwater

All islands with soil provide a receptacle for some groundwater. Because there is a shallow, relatively low-volume water table in the highly permeable soils on all of the drumlins, the groundwater is vulnerable to contamination from failed septic systems, chemical spills, leaching dumpsites, fuel spills, and saltwater intrusion.

UPLAND VEGETATION

The flora of the islands reflects a long history of human alteration. The islands' drumlins are thought to have been covered with mature forests of hemlock, maple, oak, pine, and hickory, which were cleared to support agriculture and pasturage, and to supply firewood for fuel. In addition, the construction of the islands' massive fortifications severely disrupted much of the native flora. A very limited number of trees were replanted when the islands' resorts and institutions were developed. One hundred thousand pines were planted during the Great Depression, but many were removed during World War II to clear the areas around fortifications. Today, patches of undisturbed native flora are rare on the islands; much of the flora is believed to be non-native. World's End and Thompson Island have expansive grasslands.

Little has been documented about the characteristics of the terrestrial environment. The upland vegetation on some islands is dominated by grasses and sumac. Succession beyond grasses and sumac usually does not occur because of active management or the recurrence of fires before this community can be replaced. In areas protected from fire, succession proceeds toward a community of mixed oak forest. Successional species including aspen, pine, birch, and white poplar are found on most of the islands. Thompson Island has the only community of mixed oak forest, covering approximately one-tenth of the island.

Found among the predominantly exotic plants that characterize the islands' vegetation is a substantial number of species (such as oriental bittersweet and multiflora rose) that are considered to be noxious and invasive, posing a threat to the future protection and restoration of native plant communities. NPS policy

prescribes that control of exotic species is to be accomplished through an integrated pest management (IPM) program. This approach involves developing an understanding of the pest's life cycle; evaluating all available methods of control; choosing an effective method, placing priority on the least toxic and potentially damaging treatment; and finally, evaluating its effectiveness.

Most of the fertile sites found on the islands were converted into agriculture over the past 300 years. The remnants of these attempts at subsistence farming are evident in the appearance of apples, pears, grapes, chives, garlic, asparagus, and horseradish.

TERRESTRIAL WILDLIFE

Birds

The diversity of upland and marine habitats provides good nesting and feeding opportunities for a number of bird species. Field surveys have identified more than 100 bird species including gulls, terns, herons, ducks, geese, hawks, plovers, sandpipers, doves, owls, woodpeckers, and perching birds. Perhaps the most commonly observed species are the great black-backed and herring gulls which breed and nest in great numbers throughout the harbor islands. Other significant bird species include: double-crested cormorant, Canada goose, snowy egret, great egret, great blue heron, black-crowned night heron, least tern, red-winged blackbird, and mourning dove.

Some birds on the islands are neotropical migrant species that move to North America in late spring and summer from Central and South America to breed and then return in fall. Populations of many neotropical migrants are declining due to loss of breeding and wintering habitat, and loss of feeding and resting places along migration routes. During migration, large numbers of shorebirds utilize the mudflats and salt marshes around the harbor, while transient hawks and songbirds regularly make use of the more remote islands, or those with suitable habitat. In late fall and winter, great flocks of waterfowl gather in harbor waters.

Mammals

A few species of terrestrial mammals occur throughout the islands, including cottontail rabbits, raccoons, skunks, gray squirrels, mice, muskrats, voles, and Norway rats. Some of these are exotic species and may become subjects of an integrated pest management plan. Non-native cats and Norway rats can impose devastating negative impacts on small vertebrates and nesting birds.

Amphibians and Reptiles

A number of species of amphibians and reptiles reportedly occur on the islands, especially the larger ones with freshwater habitats. While no formal surveys have been conducted, Eastern garter snake, Northern brown snake, and Eastern smooth green snake are known to occur.

WETLAND AND AQUATIC MARINE VEGETATION

Seagrass beds are critical wetlands components of shallow coastal ecosystems. Sheltered bays and inlets in temperate ocean waters provide a suitable environment for eelgrass (*Zostera marina*). This productive grass flourishes close to the low-tide level. The grass holds sediment, providing food and cover for a great variety of commercially and recreationally important fauna and their prey. The leaf canopy of the seagrass bed calms the water, filters suspended matter, and, together with extensive roots and rhizomes, stabilizes sediment. The once-plentiful eelgrass is the only type of seagrass now present in Boston Harbor; it is now confined to only four isolated areas. The largest is near the south coast of Bumpkin Island, and several smaller patches occur off World's End.

WETLAND AND AQUATIC MARINE WILDLIFE

The Boston Harbor Islands provide shelter and food-rich habitats for marine birds, mammals, fishes and invertebrates, as well as nurseries for their young. Much of the Gulf of Maine fauna can be found in Boston Harbor, especially around the Brewsters.

Invertebrates

Lobsters, crabs, and clams inhabit the submerged portions of the islands. Mussels and barnacles cling to the intertidal zone. Jellyfish live in the surrounding waters. Some specific species include manta shrimp, blue mussels, bean clams, lion's mane jellies, black soft-shell clams, moon jellies, hermit crabs, bay scallops, blue crabs, oysters, quahogs, razor clams, surf clams, sea stars, channeled whelk, and green crabs.

Fish

Several species of fish live in surrounding waters. They include striped bass, bluefish, and winter flounder.

Mammals

Seals haul out on some of the outer islands. Because their feeding grounds or migratory routes are nearby, humpback, fin, minke, and North Atlantic right whales and white-sided and striped dolphins are

potential, though rare, visitors, as are gray and harbor seals as strays or strandings, and harbor porpoises.

PROTECTED SPECIES

The Endangered Species Act requires that all federal agencies ensure that any actions they conduct, authorize, or fund will not likely jeopardize the continued existence of a listed species or result in the adverse modification of critical habitat. Species proposed for listing as threatened or endangered are referred to and ranked as candidate species and are also taken into consideration. Consultation with the U.S. Fish and Wildlife Service reveals that no federally listed or proposed threatened or endangered plant or animal species under the jurisdiction of the U.S. Fish and Wildlife Services are known to occur on the Boston Harbor Islands. The harbor porpoise has been proposed for listing by the National Marine Fisheries Service. Most migratory birds are protected under the Migratory Bird Treaty Act, and marine mammals by the Marine Mammal Protection Act.

Plant and animal species that could be extirpated are listed by the Massachusetts Natural Heritage and Endangered Species Program as endangered, threatened, or of special concern. Each classification reflects the species' population size and stability, its global distribution, and the threats to habitat viability (the definitions are the same for plants and animals). The Natural Heritage Program lists six species known to exist within the park, including two species listed as threatened, and four of special concern. In 1994, the state also identified coastal heron rookeries on two islands as areas of special concern. The rare species are:

- barn owl – special concern, found on Deer, Thompson, George's, and Lovell's islands
- common tern – special concern, found on Long Island
- least tern – special concern, found on Lovell's and Rainsford islands
- Northern harrier – threatened, found on Grape Island
- sea-beach dock – threatened, found on Thompson, Bumpkin, Grape, and Peddock's islands
- American sea-blite – special concern, found on Langlee Island

OTHER HABITATS OR COMMUNITIES

Ponds

Perennial ponds are found on Thompson Island and World's End.

Freshwater Marshes

Marshes are wetlands characterized by standing water some or most of the year and are vegetated with herbaceous plants, such as cattails, grasses, or sedges. The water table may be above the surface of the ground during the spring but typically recedes to below the surface of the ground during the growing season. The soil is generally soft muck and is rich with decaying organic matter. Freshwater marshes are very productive in terms of plant growth and create a large amount of organic matter. A considerable amount of material can accumulate if it is not broken down or transported away by water flow. Over time, marshes tend to fill with organic matter and become drier communities. Freshwater marshes are found on Long, Peddock's, Middle Brewster, and World's End.

Tidal Flats

Tidal flats, both sand and mudflats, are nearly level intertidal areas adjacent to coastal waters that are protected from heavy wave turbulence and typically exposed at low tide. Sand flats, which are often associated with barrier spits, are generally less protected from wave action than mudflats and are subject to constant sand movement. In the more protected areas of a sand flat, algal mats develop. Benthic fauna colonize the area and stabilize the bottom sediments. As organic matter accumulates and mixes with the sand, mudflats are formed. Eventually salt marsh plants become established, and the area that was once bare sand can become covered with salt marsh vegetation. On the islands, major sand flats occur. Mudflats, which generally occur on the periphery and at the expanding edges of salt marshes, are found on Raccoon, Snake, and Thompson islands.

Algal mats and mudflats are critical habitat for many invertebrates. Because of this they are also important feeding areas for a variety of fish and crabs. They are also critical feeding areas for migratory shorebirds.

Salt Marshes

Salt marshes are highly productive ecosystems, dominated by saltwater cordgrass (*Spartina alterniflora*), that provide habitats for many marine organisms, including many commercially valuable species of finfish and shellfish. Salt marsh systems produce a great deal of organic matter, most of which

is flushed out by the tides into shallow marine waters. Two characteristic features of a salt marsh are meandering tidal creeks and pond holes (pannes) that often remain flooded at low tide. Salt marsh sediments are characterized by dark, very fine particles rich in organic matter (peat). The largest remaining salt marshes on the islands are found on Thompson (50 acres) and on Snake (5 acres, and smaller brackish marshes have been identified on Calf, Grape, Lovell's, and Peddock's.

Rockweed/Barnacle Communities

Rockweed/barnacle communities are characteristic of rocky outcrops, dikes, and jetties within range of tides. The tidal range, wave action, light intensity, and the surface slope create three major zones of communities. The three major zones are named for the predominant organisms: the periwinkle zone with blue-green algae and lichens, the barnacle zone, and the seaweed or rockweed zone. Little Brewster, Nix's Mate, Shag Rocks, and other islands characterized by bedrock outcroppings support these rocky intertidal communities.

Beaches

Beaches are gently sloping areas adjacent to coastal waters. They are usually exposed to wave action. The sediment is typically coarser material such as sand, gravel, or cobbles. Every island within the park, except for those that are composed largely of bedrock outcrops, has beach areas lining portions of its shores. The beaches generally most attractive to recreational users in the park are found on Spectacle (recently replenished and not yet open), Long, Lovell's, and Gallop's, and are primarily of a sandy nature, possessing comparatively few biological resources. Rocky beaches, such as Peddock's, however, provide excellent habitat for invertebrates and the animals that feed on them.

Barrier Beaches

Barrier beaches are low-lying beaches and coastal dunes separating open water or wetland systems from the ocean; they comprise a complex assemblage of different landforms, environments, habitats, land cover, and land use. Numerous federal, state, and local laws have been enacted that pertain to the use and protection of barrier beaches, including the 1982 Coastal Barrier Resources Act, as amended in 1990, and the 1972 Coastal Zone Management Act, as amended in 1990. To enhance barrier beach management, the Massachusetts Office of Coastal

Zone Management has identified and delineated barrier beaches within each coastal town. Small barrier beaches have been identified on portions of Great Brewster, Gallop's, Peddock's, Bumpkin, Long, Rainsford, and Thompson islands.

Dunes

Dunes are mounds or hills of sandy material adjacent to beaches. Constant wind and wave action can serve to push the sand landward, forming the mounds. A dune may be vegetated by dune grass, or it may have no vegetation. Two islands within the park, Lovell's and Long, have dunes. Lovell's has the more extensive dune system, whereas Long's dunes are in one discrete area on its southern shore.

CULTURAL ENVIRONMENT

BUILDINGS AND STRUCTURES

Many of the Boston Harbor Islands contain buildings and structures related to such uses as coastal defense, agriculture, commercial fishing, year-round and summer habitation, resort life, industry, public health, immigration, and social welfare. More than 100 buildings and structures, including sea walls, forts, lighthouses, gun emplacements, concrete bunkers, wood-framed cottages, and brick military and institutional buildings, reflect the long history and changing character of the Boston Harbor Islands. With several notable exceptions, the buildings and structures of the Boston Harbor Islands have not been evaluated for their historical significance but will be the subject of several studies following this general management plan.

Long Island, containing an active campus, houses health and human service programs for the city of Boston and associated tenants in roughly 20 brick buildings; it recalls the island's institutional past. Thompson Island contains administration and programs for the Thompson Island Outward Bound Education Center in 10 brick buildings and activity-related structures. Other clusters of buildings include some 40 cottages and Fort Andrews military buildings on Peddock's Island.

The partially restored Fort Warren, an impressive granite Third System fortification designated as a National Historic Landmark, has stood on George's Island as a major defensive post for the protection of the harbor in every conflict from the Civil War through World War II. Fort Andrews, erected on Peddock's Island in the first decade of the 20th century, is a rare example of a relatively intact coastal

fort of the Endicott Period (1888–1905); its 26 remaining buildings and structures, many with red brick walls and slate roofs in a simple Colonial Revival style, have suffered over 50 years of abandonment and are generally in poor condition. Military use of the islands continued into the Cold War with a Nike missile site on Long Island. Artillery batteries, constructed during successive reinforcement campaigns throughout the nation's history, remain in varying states of obscurity and disrepair on many of the islands as evidence of a continuously evolving, integrated system of coastal defense.

Navigational aids constructed to guide ships through the often treacherous harbor waters include Boston Light on Little Brewster Island, a National Historic Landmark purported to include portions of the oldest lighthouse structure in the United States; and two lights on the National Register of Historic Places, Graves Light on The Graves and Long Island Head Light on Long Island. Other navigational aids include the channel marker on Nix's Mate and the Deer Island light off the tip of Deer Island. No longer operating are Lovell's Island range lights and Spectacle Island range lights (held in storage).

Cottages on Peddock's Island, dating from the early 20th century, are the last remaining residential structures on the harbor islands (aside from the year-round institutional residences on Thompson and Little Brewster). They are occupied by their owners during the summer and allude to the former prevalence of summer communities and recreational activities in the harbor, as well as fishing communities. In recent years, the Metropolitan District Commission has been acquiring, evaluating, and removing the cottages as owners vacate them.

On Deer Island a 1889 pump station, renovated for use as a visitor center, contains a community room and exhibits of historic pumps, recalling early attempts to deal concertedly and scientifically with the region's waste water that has been discharged to Boston Harbor since 1878. Contemporary structures include 12 egg-shaped sewage "digesters" each standing 170 feet high on the southern end of the island. Part of the sewerage system is a nine-mile pipeline that will carry treated effluent beyond the harbor and into Massachusetts Bay. On Moon Island, four huge granite containers of a "state-of-the-art" sewage treatment plant built in 1873 remain, as does an outmoded and discontinued sewage treatment plant constructed about 1900 on Nut Island.

CULTURAL LANDSCAPES

The Boston Harbor Islands contain numerous cultural landscapes that, when combined with historic structures, archeological resources, and associated museum collections, relate the history and culture of the people that shaped the cultural resources in the vicinity of Boston Harbor. Most cultural landscapes of the harbor islands are characterized as "historic vernacular," those imprinted by the settlement, customs, and everyday use of people who altered the physical, biological and cultural character of their surroundings. Fields and forests once inhabited by American Indians were later used as Euro-American farms and pastures, that, when abandoned, transformed through natural succession into stands of trees, shrubs, vines, and herbaceous vegetation. On Middle Brewster and Calf islands the stone walls, house foundations, and remnants of gardens still demarcate the summer communities that thrived prior to World War I. On Grape Island a farmhouse foundation and a lone willow tree remain, while horse pastures abandoned during World War II have reverted to tree cover.

Many islands may also be defined as "ethnographic landscapes," those containing natural and cultural resources that associated people define as "heritage resources" such as contemporary settlements, subsistence communities and burial grounds. Such places can be found on Peddock's, Deer, Long, the Brewsters, and many other islands. On Peddock's Island, a community of summer cottages, previously a fishing village, has been in active use for nearly 100 years. On Deer Island, the tragic internment of "Christian Indians" during King Philip's War marks a chapter in the region's history and is a place of great importance to contemporary Indians.

A surprising number of harbor islands and associated peninsulas are "historic designed landscapes," those consciously laid out by a landscape gardener, architect, or horticulturist according to design principles or by others in a recognized style or tradition. At World's End the stymied residential development proposal conceived by landowner John Brewer in the 1880s has allowed Frederick Law Olmsted, Sr.'s design of tree-lined roads to endure with remarkable clarity and integrity, creating a unique and appealing designed landscape setting. Vestiges of military landscape design, including grading for defensive structures, and plantings that are notably uniform in species and design, can be found on

numerous islands including George's, Gallop's, Peddock's, and Long islands. On George's Island the many acres of sculpted earthen walls, batteries, parade ground, demilune, sea walls, tunnels, as well as stately shade trees, are an integral part of the defensive design of the impressive 19th century Fort Warren.

Institutional use of the harbor islands has contributed landscape spaces that reflect their nurturing and optimistic philosophies, including Gallop's, Long, Deer, Bumpkin, and Spectacle. On Gallop's Island, hedges, flowering shrubs, fruit and shade trees line walkways and surround foundations of buildings long since removed. The plants are reminders of an island that was once home for several thousand immigrants, quarantined on the island between 1867 and 1937, and for several hundred young servicemen who trained at the radio school during World War II. On Long Island, a grotto, cemeteries, an orchard, an old greenhouse, and a new greenhouse reflect the island's 100 year history of caring for those in need.

Many islands are also recognized as "historic sites," those places associated with a historic activity, event, or person. Sites such as the lighthouses on Little Brewster, The Graves, and Long Island contain landscape features that contribute to their significance. The utilitarian and barren landscape of Little Brewster, bounded by rocky bluffs, portrays the lifestyle of keepers who have tended the light for nearly 300 years.

ARCHEOLOGICAL SITES

The Boston Harbor Islands have a rich human history, some of which is revealed by physical evidence including prehistoric and historic archeological resources. The islands contain evidence of American Indian use of such archeological significance that, to date, 21 islands have been designated within an archeological district listed on the National Register of Historic Places. Archeologists assume that all islands not surveyed have potential prehistoric or pre-contact sites. In particular, the park's enabling legislation directs that park managers include programs to protect Indian burial grounds and sites associated with the King Philip's War.

Soils, which contain highly alkaline shell fragments, have helped preserve bone as well as remains of tools and foods that typically deteriorate in New England soils. This, coupled with the fact that most of the islands were never long or intensively inhabited by Euro-Americans, suggests that they are likely to provide the best remaining or most easily retrievable evidence of prehistoric human occupation

in the Boston Bay area. Similar mainland sites are less likely to have survived undisturbed. Archeologists have established that the islands were used or inhabited by humans at least 8,000 years ago, and a 4,100-year-old human skeleton unearthed on one island in the late 1960s is one of the oldest ever excavated in New England. Most known shell middens, essentially dumps for food and other waste, are on the south-facing sides of islands closest to shore, corroborating local historical speculation about the popularity of the islands for shellfishing among American Indians. Sites of other middens may since have been covered by the rising sea level.

The Moswetuset tribe, after which the colony and the Commonwealth were named, surely used the harbor islands. (Moswetuset Hummock, the residence of Sachem Chickatawbut, was nearby, in the Squantum section of Quincy, and is listed on the National Register of Historic Places.) The Moswetuset's descendants, as well as other contemporary tribes with cultural affiliation to the region, tell stories of life prior to arrival of Europeans. Archeological remains and historical documents show that American Indian use involved shellfishing and agriculture. When John Smith explored the harbor in 1614, he noted that "here are many Isles all planted with corn."

Archeological sites of the historic period have not been systematically surveyed, although many are known to exist on the islands. Fifteen types of sites are known: agricultural, cemetery, fishing colony, fortification, hospital, hotel or resort, industrial, poorhouse, prison, prisoner-of-war camp, quarantine, sewage treatment, lighthouses, dumps, and miscellaneous other site types. Many of the sites are potentially eligible for listing on the National Register of Historic Places, such as David Thompson's trading post. The sites of the Long Island poorhouse (1882) and almshouse (1891), and the Rainsford Island poorhouse (1866) and almshouse (1852), are potentially significant because of Boston's important role in the American social reform movements.

ETHNOGRAPHIC SITES

Traditionally associated groups—American Indians, and perhaps Irish, Portuguese, military families, fishermen, farmers, lighthouse keepers, and others—have ties to the Boston Harbor Islands, but research remains to be done to determine the extent of ethnographic sites on the Boston Harbor Islands. Deer Island, to single out one island of ethnographic importance, has been used historically by American

Indians, quarantined immigrants, farmers, orphans, “paupers,” military personnel, and tens of thousands of prisoners (at the recently demolished county house of corrections), but it has special significance to American Indians as a place of internment in King Philip’s War. During the winter of 1675–76, American Indians from at least four “praying villages”—people who had become Christianized and were friendly with the English settlers—were forcibly removed to Deer Island. Estimates of people held on the islands vary, but research indicates that at least half of the American Indians on the islands died of exposure or lack of food, water, or appropriate medicines. Those that were finally released in May 1676 dispersed because their existing communities had become devastated. Native Americans return to Deer Island every year in October to solemnly commemorate their ancestors’ suffering in this sorrowful historical chapter.

In the 1840s, when the potato famine drove a million or more Irish citizens to emigrate to the United States, Deer Island was a landing point for thousands, many sick and poverty-stricken, where the city of Boston established a quarantine hospital in 1847. Approximately 4,800 people were treated in the first two years, but more than 800 died and were buried in the Rest Haven Cemetery. In 1850, an almshouse was built to house paupers. Later institutional uses on Deer Island were a reform school, a county house of corrections, and a sewage treatment plant.

COLLECTIONS AND ARCHIVES

A substantial museum collection related to the Boston Harbor Islands, comprising more than 6,000 items, is scattered among more than a dozen organizations, ranging from local, city, state, and federal agencies and repositories, to private and nonprofit groups and institutions. The collection includes archeological, archival, historical, and natural history objects in a variety of print and nonprint formats. Annual reports, resource-specific monographs and anthologies, local guidebooks, natural resource inventories, interpretive materials, pamphlets and articles, other archival materials (including manuscripts, scrapbooks, clippings, and correspondence), planning documents, and technical reports are among the print matter that documents the history and continued uses of the islands’ natural and cultural resources. A broad range of historical and contemporary maps, plans, illustrations, photographs, and ephemera contribute to the overall collection as both a reference source and an

interpretive tool. A cultural landscape study on the islands will soon be published containing an annotated bibliography of relevant source material, providing standard bibliographic data as well as thematic, descriptive, and locational notations. A natural resource bibliography for the islands is under way.

SOCIOECONOMIC ENVIRONMENT

POPULATION AND EMPLOYMENT

Population in the Boston Metropolitan Area Planning Council (MAPC) region, consisting of 21 cities and 80 towns extending over 1,422 square miles, was 2,922,934 according to the 1990 census. This figure is expected to increase to 3,074,480 by the year 2020, representing an increase of 5.2 percent. Substantial increases in population of over-35 age groups are forecast for this period, with a corresponding decrease in children and young adults. By 2010 the number of people between the ages of 35 and 64 should account for 44 percent of the total population. Household numbers are also expected to increase 13.7 percent by the year 2020, a rate markedly higher than population growth due to an expected decline in household size.

Employment in the MAPC region is projected to increase by 14.6 percent by the year 2020. The principal limiting factor in future employment growth is considered to be a limited supply of labor rather than demand. In 1996 the unemployment rate for the region was 4.3 percent. Continuing low rates are forecast for the future.

THE ECONOMY

The Boston metropolitan area is the economic hub of both the Commonwealth of Massachusetts and New England, providing governmental, professional, business, financial, higher educational, and medical services as well as important transportation, communications, export, cultural, and entertainment activities. Metropolitan Boston is the seventh largest Consolidated Metropolitan Statistical Area (CMSA) in the nation.

After exceeding many measures of economic growth nationwide during the period of 1982 through 1988, the Boston metropolitan area experienced an economic decline coinciding with a regional recession in 1989 and 1990. In 1991 and 1992 the entire region continued to display weaknesses in job growth, employment rates, income, housing, and the commercial real estate market.

Economic data for the period of 1993 through

1997 indicates that the region has emerged from this recession and in most sectors has achieved a complete recovery, showing a 10.1 percent increase in total employment.

Mirroring the CMSA, Boston has shown the most dramatic economic improvements in the services, retail trade, and the finance, insurance, and real estate (FIRE) industries.

The service sector has been the city's fastest-growing industry during the past 25 years. In 1970, services accounted for just over 25 percent of the total job market. Today, service employment constitutes over 45 percent of the city's jobs.

This sector is large and varied, encompassing, among others, lawyers, health-care workers, teachers, architects, and hotel workers. The hotel industry currently employs more than 11,600 people and the cultural and entertainment sector employs nearly 10,200 people.

While wholesale trade has failed to keep up with the rest of the city's posted job gains, retail trade continues to do well, with current employment levels at near parity with pre-recession figures. This market is fueled by a large resident student and tourist population and the presence of a downtown with exceptional vitality. The city has also shown notable success in neighborhood retail trade. Boston is the first city in the country to institute the Main Streets Program—an effort managed by the National Trust for Historic Preservation to revitalize historic neighborhood retail centers. Eighty-five new businesses and more than 500 jobs have been created in 15 Main Street Districts in the city.

A significant aspect of this sector is represented by Boston's 1,700 restaurants, which generate over \$60 million in annual meals tax revenue (17 percent of the Commonwealth's total) and employ nearly 30,000 people. Visitors are estimated to spend a total of \$6.4 billion annually in metropolitan Boston establishments.

Incremental increases in Boston's economic growth have been predicted to continue in the near term in the range of one to two percent per year. This growth is expected to be driven principally by expansion in the services and FIRE sectors, but continued growth is also expected in the retail sector in both regional and neighborhood centers.

According to the Greater Boston Convention and Visitors Bureau, tourism is Massachusetts' second-ranked industry. In 1993 an estimated 2.8 million

tourists visited Boston, combining with business and other travelers to spend \$3.8 billion in Suffolk County and contributing nearly \$120 million to city and state tax revenues. It is estimated that tourism accounts for 6 to 7 percent of total local jobs. Despite the apparent significance of these figures, the travel and tourism industry is considered to offer great potential as a growth area in the region. This idea appears to be supported by the facts that the hotel and motel markets are under-served in Boston compared with national totals, that Boston hotels show high occupancy rates.

ENVIRONMENTAL CONSEQUENCES

SUMMARY OF MANAGEMENT ALTERNATIVES

ALTERNATIVE A

CONCEPT

- Emphasis on preservation of the islands' natural and cultural resources
- Visitors encouraged to discover nature and history along routes described and laid out by park managers
- Adventuresome nature of park visits; exploring nature and history on islands
- Some visitors prefer to view the islands from a boat or remain at mainland portions of the park
- Island visitors find abundant opportunities for solitude

ALTERNATIVE B

- Park is background or setting for variety of recreational opportunities that meet diverse interests of visitors
- Becomes well-known recreation area in metropolitan Boston
- Open-ended, unstructured experiences on the harbor and the islands; some elements not specifically related to the resources of the Boston Harbor Islands
- Visitors encouraged to try various programs, learn some natural and cultural history of the islands.
- Visitors experience park as busy, highly active place

MANAGEMENT AREAS

Potential Mainland Gateways

- Downtown Boston, Hingham, Lynn (existing)
- Hull, Quincy, Dorchester, Seaport, Charlestown, East Boston, Winthrop, Revere, Salem (potential)

Same as Alternative A

Areas of Special Uses

- Deer and Nut (wastewater treatment facilities)
- Long and Moon (social service and public safety facilities)
- Thompson Island (educational campus)
- Nix's Mate (navigation marker)

Same as Alternative A

Visitor Services and Park Facilities Emphasis

- "Hubs": Spectacle, George's
- Visitor center and food service
- Highest concentration of visitors on these islands
- Facilities located close to the pier

- "Hubs": Spectacle, George's, Peddock's, Long, and Deer
- Visitor centers or contact stations, food services, venues for concerts or other events spread beyond immediate vicinity of pier
- Variety of attractions

Areas of Historic Preservation Emphasis

- Around forts and fortifications of George's, Long, Lovell's, Peddock's
- Lighthouses of The Graves, Long, and Little Brewster
- Granite wastewater treatment structures of Moon

- Around forts and fortifications of George's, Long, Lovell's
- Lighthouses on The Graves and Little Brewster

Areas of Managed Landscape Emphasis

- Gallop's, Grape, Bumpkin, Webb State Park
- Portions of Deer, Nut, Spectacle, Long, Peddock's, Lovell's, Thompson, World's End

- Grape, Bumpkin, Gallop's, Rainsford, Great Brewster, Calf, Langlee, Webb State Park
- Portions of Deer, Nut, Spectacle, Long, Peddock's, Lovell's, Thompson, World's End

ALTERNATIVE C, THE PREFERRED ALTERNATIVE

- Increased opportunities for visitors to discover the natural and cultural history of Boston Harbor Islands with strong emphasis on preservation of resources
- Park managers provide visitors with creative, educational, and entertaining programs that provide meaning and bring resources alive
- Visitor programs focus attention and programs on cultural and natural history
- Partnership instills in visitors stewardship of resources; visitors return repeatedly to enjoy creative activities revolving around island resources

NO-ACTION ALTERNATIVE

- Under no-action alternative no unifying concept joining all islands and managers
- Boston Harbor Islands State Park in 1986 plan says, "The islands themselves are the basis of the plan. Concepts of each island are based on their individual assets and liabilities, and the plan...is organized around four interrelated themes: natural forces, harbor geography, harbor history, and harbor transportation-- that give coherence to the Boston Harbor Islands State Park as a whole."
- The state park encompasses 18 of the 30 islands in the national park area.

Under the current system management areas are not designated.

Same as Alternative A

Same as Alternative A

- "Primary Hubs": Spectacle, George's, Peddock's
- "Secondary Hubs": Long, and Deer (if sufficient ferry service demand)
- Visitor facilities concentrated close to the pier
- Visitor centers or visitor contact stations, restaurants or food concessions, boat rentals, small venues for events like concerts, historical pageants, and educational presentations.

- Around forts and fortifications of George's, Long, Lovell's, Peddock's
- Lighthouses at Graves, Little Brewster, Long
- Granite structures on Moon

- Grape, Bumpkin, Gallop's, Great Brewster, Rainsford, Webb State Park
- Portions of Deer, Nut, Spectacle, Long, Peddock's, Lovell's, Thompson, World's End

ALTERNATIVE A

Areas of Managed Landscape Emphasis (continued)

- Gallop's, Grape, Bumpkin, Webb State Park
- Portions of Deer, Nut, Spectacle, Long, Peddock's, Lovell's, Thompson, World's End

Areas of Natural Features Emphasis

- Outer Brewster, Middle Brewster, Green, Little Calf, Shag Rocks, Snake, Sheep, Hangman, Raccoon, Rainsford, Slate, Sheep, Raccoon, Hangman, Snake, Ragged, Langlee, Sarah, Button
- Portions of World's End, Peddock's

RESOURCE PROTECTION

- Natural and cultural resources monitored to avert overuse
- Critical or sensitive natural resources receive special emphasis
- Historic landscapes on Thompson and World's End preserved and managed
- Partnership prepares and maintains resource management plan to perpetuate park natural resources and physical and biological processes
- Plan includes monitoring, inventory, research, mitigation, interpretation of resources, and visitor-protection activities; also program activities to identify, evaluate, treat, and provide for public understanding and enjoyment of cultural resources
- Cultural resources preserved according to the Secretary of the Interior's standards for treatment of historic properties
- Actions guided by policies described in Goals and Policies section
- Responsibility assumed by each managing agency

Natural Resources

- Some islands regarded unofficially as wilderness: nature allowed to take over, no visitor facilities
- Invasive plants reduced; revegetation on some islands
- Trails developed and maintained to keep visitors from compacting soil
- A few small boardwalks through portions of salt marshes
- At Peddock's, landscape rehabilitated after cottages evaluated and removed
- Islands with disturbance-sensitive species closed to visitors during nesting and fledging seasons; other areas closed or restricted to protect threatened and endangered species
- Brewsters, except Little Brewster, open for primitive camping
- Boat tours focus on awareness of habitat values

ALTERNATIVE B

- Grape, Bumpkin, Gallop's, Rainsford, Great Brewster, Calf, Langlee, Webb State Park
- Portions of Deer, Nut, Spectacle, Long, Peddock's, Lovell's, Thompson, World's End

- Outer Brewster, Middle Brewster, Green, Little Calf, Shag Rocks, Snake, Sheep, Slate, Hangman, Raccoon, Ragged, Sarah, Button
- Portions of Peddock's, Thompson

Same as Alternative A

- Small islands (Snake, Sheep, Green, Calf, Little Calf, Hangman), may be highly restricted to protect habitat
- Many trails to accommodate visitors on most islands
- Extensive boardwalks built through salt marshes
- Vegetation management to enhance visitor access

ALTERNATIVE C, THE PREFERRED ALTERNATIVE

NO-ACTION ALTERNATIVE

- Grape, Bumpkin, Gallop's, Great Brewster, Rainsford, Webb State Park
- Portions of Deer, Nut, Spectacle, Long, Peddock's, Lovell's, Thompson, World's End

- Outer Brewster, Middle Brewster, Green, Calf, Little Calf, Shag Rocks, Snake, Sheep, Hangman, Raccoon, Slate, Langlee, Ragged, Sarah, Button, Portions of Peddock's, Thompson

Same as Alternative A

- Resource protection strategies vary according to agency practices

- Snake, Sheep, Hangman, Green, Calf, Little Calf, Middle Brewster, Outer Brewster closed (or seasonally restricted) to protect habitat or nesting sites of wildlife disturbed by human presence
- Invasive plants in designated places reduced; revegetation
- Vegetation managed for habitat health, to maintain established views, to open up new views
- Trails developed and maintained to keep visitors from compacting soil
- Boardwalks through salt marshes.
- Effort to engage public in stewardship of resources

- Nature allowed to take over on some islands with no visitor amenities; little reduction of invasive plant species
- Some revegetation; little plant restoration

ALTERNATIVE A

CULTURAL RESOURCES

- Management emphasis on preservation and rehabilitation
- Historic structures reports for the most important resources
- Sensitive archeological sites may be closed to visitors
- Sea walls repaired where important cultural resources threatened.

Carrying Capacity

- Visitor management plans developed using Visitor Experience and Resource Protection process (scientific analyses) for each management area and applied to each island
- Partnership agencies continue employing existing administrative carrying capacities until new scientific ranges established parkwide, or unless significant damage to resources evident due to overuse

RESEARCH AND INFORMATION

- Partnership would encourage needed scholarly and scientific research, disseminate findings, use findings as basis for resource protection and visitor use management
- Highest priority on inventory and monitoring program for natural and cultural resources, including vegetation and shoreline surveys, historic structures reports for major structures, historic resource studies, cultural landscape studies of certain islands, archeological investigations, and ethnographic studies with emphasis on American Indian tribes
- An electronic clearinghouse maintained by the NPS
- Expansion of existing NPS geographic information system database for resource protection and visitor use patterns analysis
- Actions guided by policies described in Goals and Policies section
- Priorities for studies on those that lead to increased protection of resources and on the feasibility of re-establishing some native species

ALTERNATIVE B

- Management emphasis on modification of some resources to serve visitors
- Historic structures reports for threatened structures
- Sea walls repaired to serve visitors and protect threatened important cultural resources

Same as Alternative A

- Visitor use managed and potentially limited, using indicators that favor resource conditions.
- Increases in number of visitors on islands lowest in this alternative

Same as Alternative A

- Priorities for studies on those that meet visitors' needs

ALTERNATIVE C, THE PREFERRED ALTERNATIVE

NO-ACTION ALTERNATIVE

- Management emphasis on preservation or rehabilitation; stabilization as interim treatment
- Historic structures reports for most important resources
- Sea walls repaired where important cultural resources threatened.

- Secretary of the Interior's standards applied to major cultural resources
- Cultural resource management stabilizes some structures and restores some structures, but many structures continue to deteriorate

Same as Alternative A

- Visitor use managed and potentially limited, using indicators that favor visitor experience in developed areas of hub islands and indicators that favor resources elsewhere.
- Increases in number of visitors on islands nearly as high as in Alternative B

- Visitation most likely stays at current levels, approximately 150,000

Same as Alternative A

- Priorities for studies on protection of resources in the areas of greatest visitor concentration, on the hub islands

- Most research continues by outside researchers in variety of institutions and agencies, without parkwide coordination

ALTERNATIVE A

VISITOR ACCESS, USE, AND ENJOYMENT

- Park identity, marketing programs (logo, park signage system, directional signage, etc.) developed
- System of mainland information kiosks, wayside exhibits, other interpretive media to orient visitors at ferry
- Water shuttles from hub islands
- Increase in number of visitors, but not equally distributed throughout
- Few visitors on some islands, many on others
- Islands with regular shuttle boat service have park ranger staff, guided tours, self-guided tours, locational signs, interpretive signs, composting toilets
- Hub islands have potable water, toilets, food service, staff
- Islands with camping have potable water, composting toilets
- Cooperative arrangements with relevant law enforcement agencies for protection of visitors
- Actions guided by policies described in Goals and Policies section
- Numerous opportunities to learn about the islands on tour boat or at mainland visitor center without being on the islands; thus, some visitation increase occurs on boats rather than islands
- Interpretive programs with park ranger and mobile exhibits aboard ferries
- Exhibits and other interpretive media based on cultural and natural resources
- Activities such as picnicking, hiking, exploring historic ruins, swimming, sailing, and kayaking would be allowed in certain areas
- Islands served by excursions but not water shuttle have few amenities
- Remote islands have no visitor services; nature takes over
- Some fragile islands, such as Snake, Sheep, Green, Calf, Little Calf, and Hangman, closed or highly restricted to protect habitat

Transportation

- Water transportation system provides access for most visitors
- Islands connected to mainland (except World's End) generally do not receive many visitors by land
- Mainland gateway areas developed in response to demand and infrastructure requirements
- Ferries travel from mainland gateways to hub islands, where water shuttles operate in loops to several other islands
- Excursions to certain islands might operate from mainland gateway or hub islands
- Private water taxi service available on call
- Ferries operate frequently in summer, less frequently in spring and fall; special excursions in winter

ALTERNATIVE B

Same as Alternative A

- Emphasis on island programs, recreational activities. Most visitors go onto islands
- Ferries and water shuttles run frequently, allow visitors to island-hop, have range of experiences in single day
- Emphasis on visitors taking part in activities on islands without advance itinerary
- Activities such as picnicking, hiking, exploring historic ruins, swimming, sailing, and kayaking encouraged
- Equipment rentals and instruction for water sports
- Visitor access to most islands including Brewsters; piers, interpretive media, basic toilet facilities
- Remote islands have occasional excursions in small boats with rangers; composting toilets, shade shelters, cooking grills, etc. may be provided

Same as Alternative A

ALTERNATIVE C, THE PREFERRED ALTERNATIVE

Same as Alternative A

- Emphasis on providing advance visitor information
- Visitors encouraged to plan itinerary from brochures, web sites, and staff at gateway kiosks before embarking on island trip; choices of activity and choices of island
- Activities such as picnicking, hiking, exploring historic ruins, swimming, sailing, and kayaking encouraged
- Equipment rentals and instruction for water sports
- Remote islands have no visitor services; nature takes over
- Some fragile islands, such as Snake, Sheep, Green, Calf, Little Calf, and Hangman, closed or highly restricted to protect habitat

Same as Alternative A

NO-ACTION ALTERNATIVE

- No parkwide interpretive themes
- Individual managing agencies continue to emphasize their own island-specific themes
- Exhibits and other interpretive media based on islands' cultural and natural resources
- Information about the islands handled more or less individually rather than through coordinated public information system

- Access to six open state park islands is contracted ferry and water shuttle
- Islands outside state park not included in the water transportation system
- Occasional excursions bring visitors to Little Brewster and other islands for natural and historical programs

ALTERNATIVE A

- Transportation system operated by private boat operators under contract to the Partnership or member agencies
- Responsibility for dock management held by the island managing agencies
- Transportation system monitored, evaluated, and adjusted as needed
- Water shuttles make circuits on regular schedule several times daily among George's, Spectacle, Gallop's, Lovell's, Grape, Bumpkin, and Peddock's
- Less frequent water shuttle schedule to several other islands where visitor programs would be available
- Some islands reached by small craft in organized excursions, including Great Brewster, Rainsford, Nut, World's End, Thompson, and Little Brewster

EDUCATION AND INTERPRETATION

- Comprehensive interpretive sign program
- Guided tours available routinely in daytime during summer season
- Seasonal programs and interpretive tours run from gateways and islands
- Before ferry trip visitors learn about park through system of mainland information kiosks, wayside exhibits, and other interpretive media
- Areas of emphasis derived from park themes; include ecology and geology of the harbor, role of the islands in coastal protection
- Educational programs, interpretive waysides throughout the island system raise public awareness about presence, culture, and history of American Indians
- Emphasis on King Philip's War period and American Indians' understanding of nature and ecology; relationship to the universe
- Programs on several islands designed and led by American Indians
- Curriculum-based programs developed through Partnership and Advisory Council for regional and national audiences
- Facilities with contemporary uses on the islands, such as the wastewater treatment plant, would have visitor interpretive programs
- Actions guided by policies described in Goals and Policies section
- Visitor programs developed around natural and cultural resources of the islands
- American Indian interpretive center developed on one island
- Environmental education programs on many islands offer intensive learning activities for schools
- Broad outreach programs to educational institutions

ALTERNATIVE B

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- Water shuttles make circuits several times a day to some islands, less frequently to others depending on demand. Islands may include George's, Spectacle, Gallop's, Lovell's, Grape, Bumpkin, Deer, Nut, Great Brewster, Rainsford, World's End, Thompson, and Little Brewster.
- Some remote islands may occasionally be visited by small craft in organized excursions.

Same as Alternative A

- Visitor programs emphasize participatory activities for visitors based on island environment; not always tied to island resources
- Large-scale events such as pageants of Civil War encampments, sound-and-light shows, theatre, and concerts

ALTERNATIVE C, THE PREFERRED ALTERNATIVE

NO-ACTION ALTERNATIVE

- Water shuttles make regular circuits once or several times daily among George's, Spectacle, Deer, Gallop's, Lovell's, Grape, Bumpkin, and Peddock's
- Rainsford, World's End, and Thompson might have less frequent boat service
- Great Brewster and Little Brewster accessible by organized excursions.

Same as Alternative A

- Visitor programs developed for George's, Lovell's, Gallop's, Grape, Bumpkin, Deer, and Worlds End
- Programs developed for Spectacle Island for opening in 2002

- Visitor programs developed around natural and cultural resources of the islands
- American Indian interpretive center developed on one island
- Environmental education programs on many islands offer intensive learning activities for schools
- Interpretation on several islands focus on contemporary uses on the islands, such as wastewater treatment facilities
- Events such as pageants of Civil War encampments, sound-and-light shows, theatre, and concerts

ALTERNATIVE A

MANAGEMENT AND OPERATIONS

- Islands managed by existing managers with overall policy established by Boston Harbor Islands Partnership
- Each island open to the public has resource protection, interpretive, maintenance, and administrative staff necessary to maintain parkwide standards
- Coordination among island managers would be done by the Boston Harbor Islands Partnership, operating largely through committees
- Staff support for Partnership and Advisory Council provided primarily by NPS; support by Partnership agency personnel as available
- Actions guided by policies described in Goals and Policies section

Potential Facility and Infrastructure Changes

- Facilities improved to meet high quality standards and unify park visually and thematically
- New infrastructure guided by environmentally sensitive philosophy and infrastructure development guidelines
- Development supports park goals
- Possible infrastructure changes:
 - handicapped-accessible piers
 - visitor contact stations or visitor centers
 - sales of park-related items
 - installation of utilities (water, electricity, communications, waste-disposal, heat) in certain areas
 - American Indian cultural center
 - environmental education center
 - camp sites
 - administrative facilities
 - maintenance facilities
 - staff housing
 - toilets
 - shade shelters
 - rehabilitation (adaptive re-use) of historic structures
 - removal of selected deteriorated structures
 - restoration of natural landscapes
 - rehabilitation of cultural landscapes
 - trails and boardwalks
 - interpretive media
 - boat moorings
 - rental facilities for water sports
- Improvements emphasize protection of park resources
- Major facilities concentrated on two islands, George's and Spectacle
- Minimal facilities developed on islands in natural resources management areas
- Examples of possible changes:
 - redesigned entrance at George's, with rehabilitation of visitor center and historic landscape
 - restoration of selected missing features of Fort Warren
 - restoration of landscapes on portions of several islands
 - adaptive re-use of several buildings of Fort Andrews
 - installation of boardwalks in portions of salt marshes

ALTERNATIVE B

Same as Alternative A

Same as Alternative A

- Improvements emphasize activities for visitors.
- Major visitor facilities and services on George's, Spectacle, Peddock's, Long, Deer
- Attractions at hubs may have elements not specifically related to resources of Boston Harbor Islands
- Examples of possible changes:
 - Peddock's possibly a major visitor destination, with rehabilitated and adaptively re-used Fort Andrews with lodgings, restaurants, shops
 - Long Island with new pier, small visitor center, exterior exhibits at Fort Strong, beach facilities, bicycle paths
 - Deer Island with small visitor center, exhibits
 - Visitor center on Spectacle would be largest; feature an "attraction" such as a multimedia presentation

ALTERNATIVE C, THE PREFERRED ALTERNATIVE

NO-ACTION ALTERNATIVE

Same as Alternative A

Same as Alternative A

- Development continues in independent fashion from agency to agency depends primarily on funding availability
- Planning for development continues separately by each agency or organization

- Improvements to facilities emphasize resource protection with accommodation of visitors in concentrated areas
- Primary hubs at George's, Spectacle, Peddock's. Secondary hubs at Long, Deer. Level of infrastructure development reflects size of hub
- Examples of possible changes:
 - rehabilitated and adaptively re-used Fort Andrews on Peddock's as conference center
 - attractions on Peddock's for day visitors
 - redesigned entrance at George's, with rehabilitation of visitor center and historic landscape
 - restoration of selected missing features of Fort Warren
 - Long Island with new pier, small visitor center, exterior exhibits at Fort Strong, beach facilities, bicycle paths
 - Deer Island with small visitor center, exhibits

ALTERNATIVE A

Costs

- Alternatives suggest conceptual-level potential changes, thus costs are approximate, for long-range planning not short-term budgeting

Capital Costs

- Upwards of \$61 million
- Gateway development range from \$4 million to \$20 million
- Special initiative on Peddock's in collaboration with private sector upwards to \$16 million (see Appendix)
- Studies and research approximately \$4 million

Operating Costs

- Approximately \$8 million.

Funding

- Funds come from all Partnership members except Advisory Council
- Federal funding provided in ratio of one-to-three, federal-to-nonfederal dollars
- Successful implementation of GMP contingent on increased financial contributions from private sources, raised primarily by Island Alliance
- Private funding expected from philanthropic and park-related revenues, use fees, income from commercial operations
- Public agencies expected to fund large infrastructure projects throughout the park
- If revenues are generated each island owner uses revenue first to maintain its own island operations
- Revenue potentially from sales in visitor centers, gateway areas, equipment rentals, interpretation or recreation programs, boat excursions, food sales, events such as concerts
- State legislation necessary for creation and retention of fees by state and local agencies and for long term leases

Boundary Adjustment

- Boundary expanded to include Nix's Mate, Shag Rocks, Snake Island, Webb State Park
- Total acreage less than two one-hundredths the size of existing Boston Harbor Islands national park area
- Each site topographically similar to and proximate to other islands; each contains resources related to park's purpose and which should be protected
- All owners support inclusion of these sites; none to be purchased
- Nix's Mate, a channel marker, site of sea lore; maintained by Coast Guard as channel marker
- Shag Rocks, 1.3-acre cluster of bedrock ledges east of Little Brewster; bird nesting areas; physically inaccessible but visually prominent from other Brewsters
- Snake Island, largely inaccessible eight-acre island in Winthrop containing mud flats and rich bird habitat; owned by Town of Winthrop
- Webb State Park, 15.5-acre site on peninsula between Back and Fore rivers in Weymouth; contains one drumlin, gravel beach, meadow, small scrub growth, trails, small parking lot; DEM acquired in 1977 to be part of its Boston Harbor Islands properties; former Nike missile site; approximately 50,000 visitors per year

ALTERNATIVE B

Same as Alternative A

- Upwards of \$88 million
- Gateway development range from \$4 million to \$20 million
- Special initiative on Peddock's in collaboration with private sector upwards to \$57 million (see Appendix)
- Studies and research approximately \$4 million

- Approximately \$8 million

Same as Alternative A

Same as Alternative A

ALTERNATIVE C, THE PREFERRED ALTERNATIVE

NO-ACTION ALTERNATIVE

Same as Alternative A

- Upwards of \$79 million
- Gateway development range from \$4 million to \$20 million
- Special initiative on Peddock's in collaboration with private sector upwards to \$56 million (see Appendix)
- Studies and research approximately \$4 million

- Approximately \$8 million

Same as Alternative A

Capital costs calculated in the short term; no long-range plan guides all the agencies and organizations

- Between 1970 and 1994, the Commonwealth expended approximately \$25 million in acquisition and capital improvements to the state park

- Cumulatively, agencies and organizations of the Partnership would continue operating costs of \$3 to \$4 million.

- Funds from individual agencies and organizations for use in their respective areas
- NPS and private funds minimal

Same as Alternative A

No changes to boundary

ENVIRONMENTAL IMPACTS

IMPACTS ON NATURAL RESOURCES

CLIMATE

No impacts to climate are anticipated with adoption of any of the alternatives.

AIR RESOURCES

Auto Emissions

Ferries depart from three locations now. Some auto-related exhaust is associated with visitors driving to and parking at these locations. The type of exhaust will include oxides of nitrogen and sulfur, which contribute to the ozone load in the air basin. Ozone standards are already exceeded in this air basin. Under all alternatives there would be an increase in the number of visitors to the islands and thus an increase in auto emissions. Alternatives B and C would have more visitors than Alternative A and thus potentially more cars being driven to departure points.

In Alternatives A, B, and C, instead of three mainland gateways, 14 gateways are possible. This would likely increase the total emissions to the air basin from auto exhaust. However, some visitors may drive shorter distances because more departure options are available. Impacts could be partially mitigated because of this, and further reduced because by the park management's encouraging the use of public transportation to gateways.

Watercraft Emissions

Passenger ferries operate from May to October to George's Island, with water shuttles to five additional islands from George's. The same emissions as described for cars plus particulates from diesel engines are released from ferries and water shuttle boats. In Alternative A additional visitors and additional passenger ferry, water shuttle, and boat excursions would be expected. In addition, to protect island resources, some programs would be conducted on-board vessels. Emissions from this additional boat traffic would add to the load of criteria pollutants in the Boston air basin. In Alternative B, ferries and water shuttles would run frequently, allowing visitors to island-hop. Excursions with rangers would also be available. This alternative also has facilities spread out over many more islands than other alternatives, encouraging visitors to use boats to access them, and thus is likely to have the greatest concentration of boat-related air emissions. Because Alternative C encourages visitors to plan ahead, the amount of

between-island boat hopping is likely to be less than in Alternative B, and has initially more concentrated development at fewer sites. This is likely to result in less boat-related air emissions than Alternative B. Since programs are conducted more frequently on land, rather than on boats, it may also have fewer boat-related emissions than Alternative A. The no-action alternative would have the lowest level of emissions since fewer islands would be open for fewer visitors than in the action alternatives and there would be less use of water transportation.

To the extent that visitors or park staff use scheduled public boat transportation, boat emissions would be mitigated. Also, well-maintained vessels would reduce emissions.

Facility Construction and Maintenance

Air emissions from construction of trails, staff housing, campsites, etc. from heavy equipment would be similar to those from cars or boats. These emissions would be temporary and exist only during the life of the construction. However, during this time, park visitors, especially those with respiratory ailments, may feel effects from ozone levels at or below federal standards (0.12 ppm). Dust from clearing and excavating building sites, building trails, stabilizing historic sites, or removing deteriorated structures would also contribute temporarily to particulates in the immediate area. Because these particulates are heavy, they would fall out quickly. Visitors to the islands where construction is ongoing may experience respiratory irritation, sneezing, etc. from dust. Best management practices, such as watering sites, would reduce air emissions of dust. Current commuter traffic to public health services and police and fire training causes some small emissions of car-related pollutants. Trail and campground maintenance may raise an unmeasurable and temporary amount of dust.

Significantly more construction of facilities would be required to implement Alternative B than Alternative A or the No-action Alternative. This could result in greater quantities of engine-related emissions. Alternative B also includes more clearing and excavating for trails, shelters, construction of piers and boat moorings, visitor centers, administrative facilities, and infrastructure not occurring in Alternative A which would increase dust beyond that in Alternative A.

Under Alternative C less development would occur on several islands than in B but more development of hub islands than in A, likely resulting

in emissions intermediate between Alternatives A and B, but closer to B than A. Development would also be initially concentrated on George's and Spectacle, with development of other hubs if ferry-service demand warranted it. Emissions would likely therefore occur at lower concentrations over a longer period of time than if Alternative B were selected. This is true both of equipment-related emissions and particulates from excavating and clearing construction sites.

GEOLOGY AND COASTAL PROCESSES

Several of the islands have experienced alterations of their coastlines, or even, in the case of Spectacle Island, their geology. Spectacle Island was originally two drumlins connected by a sandbar, but has been altered significantly by landfilling. Others, such as George's, Great Brewster, Long, and Moon, had military or other facilities built onto the island's edge and now require retaining walls or riprap to absorb the impact of waves and stabilize the coastline. Islands are subject to the natural flow of currents around the island, and therefore the natural cycle of erosion or deposition of sand and gravel. Thus even the No-Action Alternative would have impacts as a result of coastal processes.

Alternative A places more of the islands in management areas with natural resources emphasis than the others, and encourages actions to preserve or restore natural processes. As an example, sea walls that are not themselves cultural resources would be allowed to wash away unless they protect an important cultural resource. This commitment to the return of natural landscapes could result in the return of natural coastal processes in these cases. Piers or moorings to allow visitors onto the islands would be minimal compared to Alternative B or C, but formalized, handicapped-accessible piers would be added to several islands where they do not exist now. Each of these structures in the coastal zone has the potential to alter the flow of currents and sand, which could disrupt the natural coastal processes of depositing sand or rocks. Some boardwalks and trails along beach or mudflat or salt flat areas would be built. If natural vegetation that normally holds sediment in place is removed, beaches or mudflats or salt flats could be washed away.

Alternative B includes a higher percentage of management areas that allow for development (visitor services and park facilities; managed landscapes, special use emphasis) than Alternative A or C. This means structures such as formalized trails across beaches,

boardwalks in salt marshes, boat moorings, piers, etc. would likely be built on more islands. This alternative also includes fewer islands where natural features emphasis zoning would occur. It is likely that ongoing unnatural erosion would continue, and that some new sources of beach erosion may take place if these new structures are not planned with coastal processes in mind. Encouraging visitor access and use of beaches and coastal areas of many of the park's islands may also result in trampling or removal of coastal wetland or dune vegetation now holding sediment in place, resulting in its erosion.

In Alternative C, as with Alternatives A and B, boardwalks or trails built across beaches or coastal wetlands, piers, trampling and erosion of vegetation, and the restoration of natural erosion and deposition processes could all affect coastal processes. This alternative has slightly less large-scale development planned than Alternative B, and it would proceed as demand warrants it. Also, a few islands would contain areas of natural features emphasis—the same as in Alternative A and be more protected than in Alternative B. For these reasons, impacts to coastal processes in this alternative would be greater than in Alternative A, but less than in Alternative B.

WATER QUALITY

Water quality in Boston Harbor has improved since 1991; dissolved oxygen is higher and organic toxin levels have decreased. Potential sources of pollution from the islands include wastewater from septic systems, graywater from cooking, washing, etc. and surface flow, which may carry sediment, fertilizers, and herbicides or other chemicals applied to the island. Ferry and shuttle boats also likely leak oil, gas, or diesel fuel on a regular basis, even if they are well-maintained.

In Alternative A, development of facilities requiring grading would cause temporary increases of siltation, as well as washing in of oil and grease leaking from heavy equipment. Use of trails can also add sediment during storms. This alternative also includes some new toilet facilities, as well as lodging, campsites, and staff housing—all of which mean additional wastewater would be generated. Through the use of best management practices, siltation and leaks can be contained. Composting toilets can eliminate or greatly reduce the threat of septic releases. The release of graywater is likely to be insignificant if piped to deeper water.

Adopting Alternative B would result in greater development of the islands, and temporary oil and grease leaks or increases in siltation from excavating or clearing to build facilities could be greater than in Alternative A. Increases in staff housing and park maintenance facilities could increase wastewater releases or oil and grease from maintaining boats or equipment on site.

As with other development-related impacts, the impacts under Alternative C to water quality from oil and gas leaks from equipment, or siltation from excavating and clearing, would be intermediate between Alternatives A and B.

SOILS

Soils have been removed, compacted, and in some cases supplemented to build existing facilities on several of the islands over the centuries, including the wastewater treatment facilities on Deer Island, military facilities on George's, Lovell's, Peddock's, and Long, city services on Moon and Long islands, and the landfill on Spectacle Island.

Under all alternatives, increased use of islands with friable soils will cause loss of soil due to foot traffic. Development will disturb soils, compact soils, and disturb native vegetation, making disturbed areas vulnerable to colonization by exotic plants. In Alternative A the impact is not significant and can be partially mitigated by clearly developed and marked trails. In Alternative B the extent of soil loss and compaction would be greatest, as facilities are planned over a wider area and on more islands than in other alternatives. Loss and compaction of soils may be less extensive in Alternative C than in Alternative B, unless visitor demand increases to the point that other hubs are developed. If this occurs, impact to soil of full "build-out" of this alternative would be comparable to that in Alternative B.

UPLAND VEGETATION

Native Vegetation

Few stands of forests exist today on the islands. The primary vegetation is grasses and shrubs such as blackberries, raspberries, bayberry, poison ivy, and beach plum. Although some of these are not native they do hold soil in place and provide wildlife food and shelter. Control of exotic plants or management for ecosystem or habitat restoration does not currently exist for the islands.

Trails and interpretive signs are planned in Alternative A for all of the islands where mature or

successional native forests exist. Most of these islands already have trails and camping; if new or modified trails associated with this alternative are located correctly, no or only minimal impact to forests would occur. Under Alternative B, trails and interpretive signs, campsites, visitor contact stations or visitor centers, maintenance facilities, staff housing, rental facilities for fishing and water sports, lodging, and sale of park-related items may be located on the islands where stands of native forest exist. Without careful planning in locating these facilities, the forest stands may be removed or reduced from their present extent. In addition, the presence of additional visitors, especially campers, could result in accidental burning or use of trees for firewood. In Alternative C, of the islands where native forest vegetation occurs, some would have development similar to Alternative A and the others similar to Alternative B. This means some campsites and park facilities would not be built, and the chances of impacts through removal or accidental burns of forest stands is slightly less likely than in Alternative B.

Vegetative Cover/Exotic Species

Under Alternative A, development of trails, campsites, or facilities would remove vegetation and increase the potential for loss of soil or wildlife habitat. However, this alternative includes the most acres placed in natural resource emphasis. Actions in this management area include the control of exotic plants, habitat or species restoration, and ecosystem restoration. These actions would favor the return of native plant species and the loss of exotics from the mix of upland vegetation covering the islands now. Alternative B involves more development of the islands than Alternative A, and additional non-native vegetation would likely be removed as a result. It also has fewer acres in the natural features management area. Because island vegetation is not managed to eliminate exotics or return native species unless it is in the natural features management area, this alternative may result in some small improvements compared to No Action, but have less advantages for native vegetation than Alternative A. Alternative C would involve less development on islands that are now in a natural or semi-natural state than Alternative B. It also includes some islands placed in natural features emphasis which are subject to additional development as "managed landscapes" in Alternative B. Therefore the amount of vegetation removed would be less than in Alternative B, and the likelihood that native species would return would be greater than in Alternative B or No Action.

WILDLIFE

Birds

The islands are host to many shorebirds, gulls and cormorants, waterbirds, and nesting neotropical migrant species. Upland species, such as pheasants, hawks, owls, and songbirds, occupy areas vegetated with trees and shrubs. Wetland species, such as herons, ibis, and egrets, are found near freshwater or shallow brackish or salt marshes. Shorebirds such as oystercatchers, terns, and sandpipers occupy rocky and sandy beach areas. Herring gulls, cormorants, and sea ducks live either at sea or on the rocky intertidal shores. Special bird habitat or communities on the islands include those for heron rookeries, nesting gulls, common and red-throated loons, and particularly good upland bird habitat in berry thickets. Since surveys have not been performed, other unusual bird habitat may exist. Building beach trails or boardwalks would disturb and displace shorebirds and some wetland species. Development generally would remove habitat that is likely to be occupied by some species of birds. However, in natural resource management areas, habitat may be created which would support native bird species.

Existing nesting habitat would be well protected in the natural resources management area, which covers the largest extent in Alternative A. Additional development of islands for visitor use in Alternative B would remove habitat and increase disturbance. Visitors would be spread out over more of the islands than in other alternatives, causing birds sensitive to human disturbance to move or leave the islands. Overall, Alternative B is likely to have a greatest adverse effect on birds. Under Alternative C the concentration of visitors would be greater on hub islands than in Alternative A, but lower on some of the other islands than in Alternative B. This would likely reduce impacts to birds, since they are already disturbed in areas where facilities would be focused. However, if visitor demand results in the development of two secondary hubs, impacts to birds could be similar to those described for Alternative B.

Mammals

Rabbits, raccoons, skunks, squirrels, mice, muskrats, and Norway rats roam the islands. No comprehensive management of these species occurs on the islands now. Development has removed habitat for some of these mammals. Non-native or feral species may have been introduced inadvertently by visitors or those using the islands. Control of exotics and the

restoration of native species and habitat are actions in management areas of natural resources emphasis.

Alternative A has the largest acreage of this type, and so could result in elimination of non-native mammals. It also has the least area proposed for development and the fewest visitors on the islands. These factors would mean it would create the least displacement and disturbance of the action alternatives. Alternative B would likely remove the greatest amount of habitat used by terrestrial mammals on the islands and create the most disturbance through noise and the presence of human activity. The impacts of Alternative C would be similar to those of Alternative A initially. However, if visitor demand increases, additional hub islands would be developed and some wildlife habitat removed in those areas.

WETLAND AND AQUATIC MARINE VEGETATION

Seagrass Beds

Eelgrass is the last remaining type of seagrass in Boston Harbor. It provides cover and food for a variety of fish, as well as filtering suspended solids from the water column. It is considered a critical wetland component for many commercial fish species. Although it was once plentiful, it is now present in only three areas. Several small patches occur between Bumpkin Island and World's End. Although it normally occurs in water less than two meters deep, it occurs in deeper water off Bumpkin Island because the water is clear, and light can penetrate deeply.

Under Alternative A turbidity associated with increased boat traffic or trail use could eliminate deeper-water patches of eelgrass off Bumpkin Island. A pier could directly eliminate some of the eelgrass, or could increase turbidity and pollution during construction. Releases of wastewater high in nitrogen (typical of septic systems) could eliminate eelgrass, as it is sensitive to nutrient loading. Composting toilets, and the careful location of the pier away from the south of the island, would mitigate impacts to the eelgrass. In Alternative B Bumpkin Island would have potentially more campsites, a larger visitor contact station, maintenance and staff facilities to handle more visitors and more boat trips. This could mean increased septic outflow on Bumpkin Island. Sediment may be washed into the water during construction of these facilities as well. All would increase the probability that eelgrass would be adversely affected. The effect could be significant unless facilities are sited carefully and other mitigation measures (such as

composting toilets, BMPs during construction) are used. The facilities planned for Bumpkin in Alternative C are the same as in Alternative A. The impacts to eelgrass would be the same as described in Alternative A.

WETLAND AND AQUATIC MARINE WILDLIFE

Invertebrates

Many species of clams, mussels, scallops, oysters, and crabs occupy the intertidal zone—both on rocky shores and in mud or salt flats of the islands. They provide food for shorebirds, mammals, and humans. It is likely that development of the islands has adversely affected habitat for these invertebrates, and that the proposed development that would occur under any of the alternatives would further this effect through siltation, direct removal of beds (to create piers, for instance), and access by visitors who may dig clams, catch crabs, etc.

In Alternative A the actions that might adversely affect intertidal invertebrates include providing visitor access; beach trails, piers, and boardwalks that remove habitat; boat traffic or trail use that increases turbidity, and construction which may increase siltation for a temporary period of time. Alternative A has less than Alternatives B or C of each of these except boat traffic, which may include presentations of programs from boats instead of onshore. If these programs are conducted well away from the shore, no impacts are expected to intertidal invertebrates from them. Alternative B has a greater potential to adversely affect these species, since it includes many more piers to provide access and developed facilities on more islands. This spreads access and the impact of visitors over more of the islands. This alternative also includes more overnight lodging facilities and campsites than Alternative A or the No-Action Alternative. Alternative C would probably have less impact to intertidal invertebrates than Alternative B, but more than Alternative A, at least in the short term. If visitor use increases, access to other islands will be created and populations of these species will experience impact.

Fish

Sport fishing, including fishing contests, is more numerous than had been the case before Boston Harbor was cleaned up.

The impacts on fish would be much the same in all alternatives. It is unlikely that the degree of fishing pressure from island visitors would have more than a negligible or minor impact on fish population size or

health in the area even though some alternatives would have fewer piers than others.

Mammals

Seals, including hooded, harp, and ringed seals, sometimes use the rocks of the outer islands to haul out. Marine mammals, including several species of whales and dolphins, feed and migrate through the area, and Stellwagen Bank east of the harbor is an important nursery and feeding ground for humpback, fin, and Northern right whales.

Increased boat traffic associated with all action alternatives may pollute ocean water slightly with oil, grease, and black or graywater releases. Engine noise may also disturb marine mammals. These actions are expected to have only negligible impacts on dolphins and whales. Increased visitor activity or boat docking may disturb seals if it is in the immediate vicinity.

Alternative B includes access to more islands and more visitor services such as trails and campsites. This increase in human activity along the coast could result in disturbance to seals. In Alternative C the impact of human activity would be intermediate between Alternatives A and B.

PROTECTED PLANT SPECIES

State listed plant species are Sea-beach Dock and American Sea Blite, which occur on five islands. Trails and interpretive signs are planned in Alternative A for all of the islands where protected plants are known to occur. Larger-scale facilities, including park facilities, staff housing, campsites, and a cultural center, may be built under a special initiative on Peddock's. Surveys to locate all patches of Sea-beach Dock will be required before development of these facilities can begin. Parts of Thompson and Peddock's and all of Langlee island are in the natural resources management area. Closing these areas to public use, or restoring habitat so these species can expand, are both possible. More development may take place on these islands in Alternative B than in Alternatives A or C. In addition, portions of Peddock's Island and all of Langlee would not be in the natural resources management area. Development on Peddock's could include a visitor center, lodging, and sales items. Impacts could be mitigated by surveying, avoiding building on populations of these plants, and posting signs or otherwise keeping visitors from trampling them. Under Alternative C impacts would be intermediate between Alternatives A and B, with Langlee in natural resource area and no development

proposed. Where development could occur (on the other islands), surveys and avoidance through relocation of facilities, trails, and signs for visitors would prevent impacts.

PROTECTED BIRD SPECIES

Least Tern

The Least Tern is a waterbird that eats small fish or aquatic invertebrates. It nests on sandy beaches or gravel bars, and has been seen on Lovell's and Rainsford islands. This species is listed as one of special concern in the state of Massachusetts.

In Alternative A the development and use of boardwalks or beach trails on Lovell's and Rainsford islands could increase human access to and therefore disturb nesting least terns. Impacts from development would remain nearly the same for Rainsford Island as in Alternative A but would increase on Lovell's, as campsites and staff housing are added as proposed. Under Alternative C development on Lovell's would be the same as in Alternative A, and on Rainsford the same as in Alternative B. Impacts to the tern in this alternative would be intermediate between A and B overall.

Northern Harrier

The Northern Harrier hawk species listed as threatened by the state, has been known to inhabit Grape Island. Harriers occupy open fields and hunt small rodents.

Proposed development of Grape Island includes trails, staff housing, and shade shelters. If these are sited to avoid the area where these birds are roosting or hunting, the Harrier may not be affected. Alternative B includes campsites, administrative facilities, and maintenance facilities on Grape Island in addition to those described for Alternative A. The chances that individuals Harriers would remain and hunt on the island with increasing human activity are low unless their feeding and roosting area can be closed to campers and hikers, and no development located there. The development proposed for Grape Island in Alternative C is the same as for Alternative A. Impacts to the Harrier would also be the same.

Common Tern

The Common Tern is a larger relative of the Least Tern that can occupy lake or ocean bay islands or beaches. It has been found on Long Island. It is listed as a species of special concern by the state.

Alternative A proposes additional public access on Long Island, and park visitors might stroll along

beaches; boardwalks or trails. Such trails or boardwalks could disturb terns, which may fledge fewer young or leave nests. In addition to trails, boardwalks, and a pier, Alternative B envisions beach facilities, staff housing, a visitor center, and rental facilities for water sports. This level of beach-oriented development is likely to eliminate tern nesting, unless it is carefully located to avoid the terns, and the tern nesting area is closed to public access. In Alternative C the level of proposed development would be comparable or slightly higher than Alternative A.

Barn Owl

Barn owls occupy woodlands, groves, fields, and farms. They nest in hollow trees or airy abandoned buildings or barns, and have been sighted on Deer, Thompson, George's, and Lovell's Islands. This is a state-listed species of special concern.

No new development on Deer or Thompson islands is proposed in Alternative A, and changes to George's Island would probably not disturb barn owls as the focus would be on pier improvements. However, changes at Lovell's, including construction and adaptive re-use of historic structures or removal of deteriorated structures, may disturb nesting or roosting barn owls. Under Alternative B, in addition to changes described in Alternative A, changes would include proposed campsites and park facilities. If these are located away from the successional forest where barn owls may be nesting or roosting, impacts could be minimal. However, campsites or staff housing in the forest could remove habitat and cause permanent disturbance from human presence. In Alternative C, impacts would be similar to Alternative A on Lovell's Island.

SPECIAL COMMUNITIES OR HABITATS

Freshwater Wetlands

Areas on the islands that are permanently covered or inundated for much of the year with shallow freshwater are rare. A perennial pond occurs on Thompson Island, freshwater marshes occur on Long and Middle Brewster islands. These wetlands are productive communities that provide habitat, food, and nesting space for a variety of fish and birds.

Thompson and Long islands would be somewhat developed with trails and toilets in Alternative A. Some of these trails may be boardwalks that deliberately ring or impinge on wetland areas so that visitors may observe the greater abundance of wildlife. The construction and use of trails or boardwalks in or

around wetlands may disturb or even displace nesting birds. It may also remove vegetation or require filling to place boardwalk pilings. The filling of wetlands would require approval by the municipality under the state wetlands protection law, and by a special division of the NPS, as well as a permit from the U.S. Army Corps of Engineers and additional NEPA compliance.

In Alternative B Long Island may have more extensive boardwalks than in Alternative A. The construction of large facilities, such as a visitor center, lodging, or a cultural center, could either result in the removal of wetland vegetation (if permissions were obtained) or increased siltation or nutrient loading through septic failure. Increased visitor use could disturb or displace wetland birds. Adopting Alternative C could eventually mean the development of a secondary hub at Long Island, thus additional facilities such as campsites and administrative facilities. The additional human presence, as well as construction noise and the chance of siltation of wetlands, means Alternative C may have greater impacts on this resource than Alternative A.

Tidal Flats

Sand and mud flats provide habitat colonized by benthic (bottom-dwelling) invertebrates, such as clams and crabs. Some grow algal mats, which provide habitat for plankton and can act as a nursery for crabs, small fish, or larval clams. They are highly productive coastal wetlands, and support a variety of fish, birds, and invertebrates, as well as dampen the effect of wave action, particularly in a storm. Mudflats are found on Raccoon and Snake islands.

No change to existing conditions is proposed to either Raccoon or Snake Island in any alternative. At the present time, access to the 3-acre Raccoon Island is by private craft only, and visitors are discouraged from accessing the 11-acre Snake Island.

Salt Marshes

Eventually, a mudflat fills with sediment and salt marsh plants become established. These highly productive ecosystems are dominated by saltwater cordgrass, a species that provides cover and nursery habitat for a variety of fish and shellfish. Sediments are rich organics that provide burrowing worms and other invertebrates with abundant food. Larger salt marshes on the islands occur on Thompson Island (50 acres) and Snake Island (5 acres). Smaller brackish marshes exist on Calf, Gallop's, Grape, Lovell's, and Peddock's. Much of the original salt marsh and wetland area on the

south end of Thompson Island has already been diked and drained for agriculture.

All alternatives propose the addition of some trails and small-scale visitor facilities for Thompson Island. If these are sited in or near the marsh, it may result in the removal of habitat, or the disturbance and displacement of birds or invertebrates. No changes are planned for Snake Island in any alternative.

Alternative A calls for increased access via piers and trails to the remaining islands where coastal marshes exist, with the exception of Calf Island. If sited in or near salt marshes, these facilities may increase disturbance or siltation, which would degrade the quality of the marsh for wildlife. Significantly greater development on all islands, except Snake and Thompson, would occur under Alternative B than under any other alternative. The small salt marshes of these islands could be highly sensitive to the higher levels of visitor use. Campers or day-use visitors hunting crabs or fish could reduce populations, and trampling could collapse the banks holding brackish water or eliminate vegetation. This would lead to increased erosion, increased turbidity, and reduced habitat. Impacts under Alternative C would be the same as under Alternative A.

Rockweed and Barnacle Communities

These communities characterize rocky outcrops or manmade structures within the tidal range. They support lichens, barnacles, and other gastropods on which seabirds feed, as well as algae and seaweed. Tidal pools in this zone also support a variety of marine invertebrates, including mussels, snails, starfish, crabs, sea anemones, and horseshoe crabs. They exist on Brewsters and other islands of rock outcrops. These communities are easily impacted by intensive use. Significant numbers of people walking on the rocks can virtually eliminate all life forms in these communities by crushing and trampling the plants and animals that live there.

The outer islands would be in the management area for natural resource protection under Alternative A and would remain as inaccessible as they are now; therefore significant impacts to this community are not expected. Under Alternative B, Great Brewster and Little Brewster would both be developed with piers, and visitor amenities. Providing visitor access to these islands is likely to result in the destruction of a part of their rocky intertidal communities. Impacts under Alternative C would be similar to those of Alternative

As long as visitors are allowed on islands and facilities introduced for their benefit.

Barrier Beaches

Barrier beaches separate freshwater or wetland systems from the ocean and are protected by several laws. They have been identified on Great Brewster, Gallop's, Peddock's, Bumpkin, Long, Rainsford, and Thompson islands.

Trampling of barrier beach vegetation causes increased erosion and eventual blow-outs of barrier beaches, with resulting loss of function in separating salt and fresh water. Non-vegetated dunes on barrier beaches (and elsewhere) are much more resistant to significant physical impacts from visitor use (since the sand tends to move freely anyway, visitors walking/sliding on the dunes are usually not a significant factor).

Increased visitation to Bumpkin, Gallop's, Long, and Thompson islands proposed in Alternatives A and C may result in blow-outs and erosion of these natural features. In Alternative B, significantly greater development of the islands for visitors, as well as access to Great Brewster and Rainsford in addition to all other islands on which barrier beaches have been located, is likely to result in trampling of vegetation and loss of barrier beach function in some cases. Mitigating measures, such as fencing, could be implemented in all alternatives.

Dunes

Dunes are fairly unusual on the islands. They may provide protection from wind or wave action, particularly when stabilized by vegetation. They occur on Lovell's and Long Islands.

In Alternatives A and C, trampling of vegetated dunes could subject them to severe damage. Access and trails, including boardwalks, are planned for both islands where dunes occur in this alternative. Trails or boardwalks across dunes could remove vegetation or the dunes themselves; increased visitor use could also result in the damage or destruction of dunes. In Alternative B, beach facilities, shade shelters, rental facilities for water sports, and other beach-oriented development proposed for Long Island, as well as campsites and park facilities proposed for Lovell's Island in this alternative, could result in destruction of dunes directly if facilities are sited on them, or through increases in trampling from visitors.

IMPACTS ON CULTURAL RESOURCES

BUILDINGS and STRUCTURES

The park has more than 100 structures, including forts, lighthouses, institutional buildings, cottages, and gun emplacements. Except for the National Historic Landmarks, National Register properties, and several notable other buildings, the structures have not been evaluated for their historical significance.

Under all alternatives, historic structures would be treated according to the Secretary of the Interior's standards for historic preservation. Under Alternative A the preservation of historic structures and their environments would be maximized relative to the other alternatives. Beneficial impacts would be limited to areas managed with an historic preservation emphasis, including protected and eligible properties for the National Register of Historic Places. Preservation efforts directed toward individual or isolated groupings of buildings and structures outside of the broader geographical, historical, and interpretive contexts of the entire area may have an adverse impact on the historic integrity of non-targeted resources and on the area's cultural resources, when viewed as an integrated system. Emphasis placed on the rehabilitation of some historic structures and the encouragement of recreational exploration of historic ruins may have an adverse impact on some cultural resources that are currently in fragmented form. With Alternative B the rehabilitation of some historic buildings and structures would stabilize deteriorating cultural resources, but increased traffic could outweigh the mitigating effects of the proposed actions. Buildings and structures within areas designated for a managed landscape emphasis may be adversely affected by high visitation and extensive recreational use of island resources. Impacts under Alternative C would be similar to those described for Alternative A. Under the No-Action Alternative, few areas of the park would receive the funds necessary to bring buildings up to standards for visitors, and thus they would deteriorate further. Visitors would be either prohibited or discouraged from areas where structures are in poor condition and cannot be stabilized.

CULTURAL LANDSCAPES

By their nature, cultural landscapes are altered by humans. On the Boston Harbor Islands the numerous varied types of cultural landscapes (historic vernacular, ethnographic landscapes, historic designed landscapes)

are unevaluated for their historic significance. They are found on most islands. The Secretary of the Interior's Standards for Historic Preservation would be used in prescribing treatments.

Under Alternative A the restoration of some landscapes and the management of non-native vegetation might adversely affect some cultural landscapes because some exotic plants may be important or significant features. Minimal trail development, directed activities, and low-end visitation would reduce potential adverse impacts to the islands' cultural resources. With Alternative B, emphasis on open-ended and unstructured visitor experiences and the extension of visitor services and park facilities to additional islands and interior locations would have an adverse impact on unidentified and unprotected cultural landscapes. Facilities for anticipated high visitation, such as trail development and the removal of non-native plants, would adversely affect some cultural landscapes. Excavation and construction for major visitor facilities may have an adverse impact on cultural landscapes and may put natural and cultural resources to recreational uses not specifically related to the resources rather than for important or significant historic land use patterns. Alternative C impacts would be similar to those of Alternative A. The No-Action Alternative would have higher impacts than A or C but a lower level than B.

ARCHEOLOGICAL RESOURCES

Most, if not all, islands have actual or potential prehistoric or pre-contact sites, according to archeologists. Archeological resources, many of which are found in shell middens, include remains of food and other waste, tools, and bones. Construction for facilities, new plantings, trail improvements, and virtually anything that requires disturbance of the soil can affect archeological resources. Under state and federal regulations, archeological resources are protected. Prior to disturbance of the soil, an investigation is done to ascertain the presence of archaeological resources. Mitigation measures are taken for known sites. Investigations can cause delays in construction schedules and may increase construction costs.

In all alternatives, archeological resources will be identified through systematic surveys. With more information about the types of resources present and their locations, sensitive sites can be avoided or mitigation begun well in advance of soil disturbance.

ETHNOGRAPHIC RESOURCES

Ethnographic resources are associated with ethnic or traditionally associated groups that occupied the Boston Harbor Islands—certainly American Indians, and perhaps Irish, Portuguese, military families, fishermen, farmers, lighthouse keepers, and others. Research remains to be done to determine the extent of ethnographic sites on the Boston Harbor Islands. Since ethnographic sites are generally unknown, protection is ad hoc, and impacts from the alternatives cannot be determined.

MUSEUM COLLECTIONS

A substantial museum collection comprises more than 6,000 items and is housed among more than a dozen organizations. The collection includes archeological, archival, historical, and natural history objects in a variety of print and nonprint formats.

Under all alternatives, collections management would continue to vary depending on the managing agency. There will be no central repository. In Alternatives A, B, and C collections would continue to be maintained by various agencies at NPS standards, and the NPS would maintain a central database.

SOCIOECONOMIC IMPACTS

The Boston Harbor Islands are known for attracting a broad cross section of the population, from international tourists to inner-city school children. All the alternatives have similar positive impacts on the sociological environment. In terms of economy, the following impacts might be expected, based on the application of the NPS "money generation model." With visitation currently at approximately 150,000 per year, an estimated \$9 million in income, \$1.5 million in tax revenue, and 330 jobs are generated to the local economy.

If the islands are developed at a low-to-moderate level as Alternative A suggests, with docks, improved sanitation, and other visitor facilities, and approximately 200,000 visitors annually, \$12.4 million in income, \$2 million in tax revenue, and 450 jobs might be expected to be generated to the local economy.

Alternatives B and C would have the islands developed more intensively with, for example, more food services, lodgings, camping, equipment rentals, and different types of amusements; at least 400,000 persons might visit the islands each year, which would increase income by \$24 million, add \$4 million to tax income, and add 880 jobs to the area labor force.

CONSULTATION AND COORDINATION

SUMMARY OF PLANNING

Following addition of the Boston Harbor Islands to the National Park System in November 1996, members of the Boston Harbor Islands Partnership were appointed by the Secretary of the Interior and the Secretary of Transportation and convened for their first meeting on June 26, 1997. By fall 1997, a planning team from the National Park Service began working with a committee of the Partnership to develop the general management plan, a process that has involved monthly Planning Committee meetings, reports to the Partnership, presentations, public workshops, meetings with various advocacy and interest groups, and working sessions with staff from agencies and organizations that own and manage property in the park. The NPS planning team benefited from its members' previous work on the Boston Harbor Islands Special Resource Study. That work gained them familiarity both with the resource and the personnel involved in the Boston Harbor Islands.

A community-based planning process to shape the Boston Harbor Islands Advisory Council—whose members would be appointed by the Director of the National Park Service—began in fall 1997. After a series of workshops, the appointments were made in late winter 1998. Following election of officers and representatives to the Partnership in March 1998, two members of the Advisory Council took seats on the Partnership at the April 1998 meeting.

During the first three months of 1998, the Partnership sponsored seven public workshops throughout the region. The scoping workshops were structured to elicit broad comment and to engage a cross-section of staff members from the Partnership agencies as facilitators. Despite unfavorable New England winter weather, large numbers of people came to the workshops and spoke of their ideas and concerns about the islands. (See Appendix for a summary of the comments from these meetings.) One of the workshops was held at the North American Indian Center of Boston, with representatives of many tribes attending. Additionally, on March 9, 1998, the National Park Service held a consultation meeting with representatives of participant tribes of the Mûhheconneuk Intertribal Committee on Deer Island, the Penobscot Nation, the Wampanoag Tribe of Aquinnah (Gayhead), the Stockbridge-Munsee band of Mohican Tribe, the Delaware Tribe of Western Oklahoma, and the

Mashantucket-Pequot Tribal Nation.

Three newsletters have been published during the planning process. The first announced the start of the planning process, the second (more than 10,000 copies distributed) publicized the community workshops, and the third described alternative concepts for the general management plan. Newsletters have also been posted on the park's web site.

Consultation proceeded with the State Historic Preservation Officer and with the Massachusetts Environmental Policy Office. Informal consultation has taken place with members of the Congressional delegation and state and local elected officials. Resource data on the island system continues to be gathered and analyzed on an ongoing basis. Notable research projects are a cultural landscape study; extensive bibliographies of cultural and natural resources compiled from regional and agency archives; a compilation of a geographic information systems (GIS) database; and a study of intermodal transportation service for the islands. GIS maps and other resource maps have been used by planners in analyzing resources and visitor patterns for the development of management areas.

With analysis of the resources and of public and agency comments, the NPS team, with the Planning Committee, outlined several directions for management alternatives. They then devised a range of visitor experiences and resource conditions and proposed six management areas that would prescribe resource conditions and visitor experiences throughout the park. The following criteria were developed and used in identifying geographic management areas.

- **Mainland Gateway Areas**—Mainland areas adequately sized and situated to provide facilities for transportation and major visitor services; good vehicular or mass transit access that does not disturb residential areas; ability to accommodate a high level of visitor activity without significant negative effects.
- **Visitor Services and Park Facilities Emphasis**—Island areas that have been previously disturbed or developed; that have little natural resource value; that are able to accommodate a high level of visitor activity without significant negative effects.
- **Historic Preservation Emphasis**—Island areas that contain historic buildings, structures, or landscapes; with mainly historic resource values; and are potentially affected by visitor activity.

- **Managed Landscapes Emphasis**—Island areas that reflect the imprint of human use (but not of primary cultural resource value); that retain some character-defining cultural resource features; that are able to accommodate a moderate level of visitor activity without significant negative effects.
- **Natural Features Emphasis**—Island areas that predominantly reflect forces of nature; that retain some feeling of “wilderness”; that potentially are affected by visitor activity.
- **Special Uses Emphasis**—Island areas that have already been developed by public agencies, and will continue to be used for nonpark public functions, such as MWRA’s Deer Island sewage treatment facility and the health facilities at Long Island.

The term “management zones” was used initially, but was changed to “management areas” when it became evident that people interpreted “zone” as in municipal zoning, which assumes a concept of full build-out rather than a permissive concept for identifying and prescribing future resource conditions and visitor experiences.

Considerable public comment followed the publication of the alternatives newsletter in which two alternative management concepts were presented. The Planning Committee and the NPS team made a presentation to the Partnership and the Advisory Council, attended a number of public meetings, and held many discussions to reach the conclusion that a third alternative concept was desired, which combined features from each original concept. Thus, Alternative C was created. Subsequently, the relative environmental impacts of each alternative have been analyzed and a preferred alternative has been selected. The preferred alternative, Alternative C, has been endorsed by both the Partnership and the Advisory Council. However, the Partnership will reconsider all alternatives and make a final selection following public review of and comments on the draft general management plan and draft environmental impact statement.

COMPLIANCE WITH FEDERAL AND STATE LAWS AND REGULATIONS

In implementing the Boston Harbor Islands general management plan, the Partnership agencies will comply with all applicable laws and executive orders, such as those listed below. Consultation and coordination with appropriate federal and state agencies have been conducted during the preparation of this document. Regarding cultural resources,

consultation with the State Historic Preservation Office (SHPO) was initiated in June 1999, and a review copy of the draft general management plan and draft environmental impact statement was submitted in August 1999.

NATURAL RESOURCES

- **National Environment Policy Act of 1969 (NEPA)**—The *Draft Environmental Impact Statement* will be on public review for 60 days. The *Final Environmental Impact Statement* will respond to or incorporate public comments submitted during the comment period.
- **Massachusetts Environmental Policy Act (MEPA)**—Resembles the federal process of public review and comments. Since the GMP is a policy-level document, a formal MEPA process is not applicable. Future development actions may be reviewed under a “Special Review Procedure” set up for the Partnership.
- **Endangered Species Act of 1973**, as amended (16 USC 1531 et seq.)—Section 7 requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat.
- **Federal Water Pollution Control Act**, as amended, **Clean Water Act of 1977**, and **Water Quality Act of 1987** (33 USC 1251-1376)—Proposed actions would have little if any negative effect on water quality. All construction would comply with the requirements of sections 401 and 404 of the Clean Water Act and other applicable federal, state, and local regulations.
- **Massachusetts Natural Heritage and Endangered Species Program**—The Partnership will cooperate with the state to ensure that any state-listed species within the Boston Harbor Islands national park area are protected.
- **Coastal Zone Management Act (1972)** and **Coastal Barrier Resources Act (1982)** both as amended in 1990 —The Boston Harbor Islands lie within the Massachusetts coastal zone. Activities in the park must be consistent with Massachusetts coastal zone management policies.
- **Massachusetts Wetlands Protection Act** (M.G.L. ch. 131, S. 40; 1965 and amended)—Municipal conservation commissions are responsible for enforcing this state law, one of the strictest in the country, to protect inland and coastal wetlands.

CULTURAL RESOURCES

Cultural resources within the Boston Harbor Islands will be managed in accordance with National Park

Service policies, including the “organic act ” of 1916; the Antiquities Act of 1906 (16 USC 431); the National Historic Preservation Act of 1966, as amended (16 USC 470); the National Environmental Policy Act of 1969, as amended (42 USC 4321, 4331, 4332); the Archeological Resources Protection Act of 1979 (16 USC 470); and the Native Americans Graves Protection and Repatriation Act of 1990 (25 USC 3001).

Section 106 of the National Historic Preservation Act requires that federal agencies that have direct or indirect jurisdiction take into account the effect of undertakings on National Register listed or eligible properties and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. In implementing the approved general management plan, the Partnership will consider developing a programmatic agreement with the Massachusetts State Historic Preservation Officer that takes into account the unique management structure of the Boston Harbor Islands and is consistent with the requirements of 36 CFR 800 and the 1995 Programmatic Agreement among the National Conference of State Historic Preservation Officers, the ACHP, and the National Park Service. The 1995 agreement requires the NPS to work closely with the state historic preservation officer (SHPO) and the ACHP in planning for national park areas.

The 1995 Programmatic Agreement also provides for a number of programmatic exclusions for specific actions that are not likely to have an adverse effect on cultural resources. The actions may be implemented without further review by the Massachusetts State Historic Preservation Officer or the ACHP provided that National Park Service internal review finds the actions to meet certain conditions. Undertakings, as defined in 36 CFR 800, not specifically excluded in the Programmatic Agreement must be reviewed by the state historic preservation officer and the Advisory Council before implementation. Throughout the process there will be early consultation on all potential actions.

Prior to any ground-disturbing action by park managers, a professional archeologist would determine the need for archeological activity or testing evaluation. Any such studies would be carried out in conjunction with construction and would meet the needs of the state historic preservation office. Section 110 of the National Historic Preservation Act requires the NPS to identify and nominate to the National Register of Historic Places all resources under its jurisdiction that appear to be eligible. Historic areas of the national park system are automatically listed on the National Register upon their establishment by law or executive order.

The following table identifies actions contained within the general management plan alternatives that would likely require review under Section 106 of the National Historic Preservation Act and under the 1995 Programmatic Agreement and the nature of the review.

POTENTIAL ACTIONS WHICH MAY OCCUR IN ONE OR MORE ALTERNATIVES

COMPLIANCE REQUIREMENTS

Rehabilitate historic structures for visitors and staff use	SHPO consultation
Remove unsafe structures	SHPO consultation to determine eligibility for National Register to mitigate adverse effects
Install health and safety improvements to buildings and facilities	Review by NPS cultural resource specialists (stipulation IV. B, 10)
Install utilities	SHPO consultation
Preserve and maintain historic structures	Review by NPS cultural resource specialists (stipulation IV. B, 1)
Construct new piers or rehabilitate existing piers	SHPO consultation
Construct new buildings for visitor or staff use	SHPO consultation
Construct freestanding waysides and signage	Review by NPS cultural resource specialists (stipulation IV. B, 10)
Construct amphitheater	SHPO consultation
Install composting toilets	SHPO consultation
Expand trail and walkway system	SHPO consultation
Install shade shelters	SHPO consultation
Build camp sites	SHPO consultation
Rehabilitate cultural landscapes or restore native vegetation	SHPO consultation on cultural landscape treatment plan

LIST OF DEIS RECIPIENTS

FEDERAL ELECTED OFFICIALS

Senator Edward M. Kennedy
Senator John F. Kerry
Congressman Michael Capuano
8th Congressional District
Congressman William Delahunt
10th Congressional District
Congressman Barney Frank
4th Congressional District
Congressman Edward Markey
7th Congressional District
Congressman Joseph Moakley
9th Congressional District
Congressman John Tierney
6th Congressional District

FEDERAL AGENCIES

Advisory Council on Historic Preservation
Department of Agriculture
Natural Resources Conservation Service
Department of Commerce
National Oceanic and Atmospheric Administration,
National Marine Fisheries Service
Department of the Interior
Fish and Wildlife Service
Environmental Protection Agency
United States Coast Guard
Boston Harbor Islands Partnership
Boston Harbor Islands Advisory Council
John F. Kennedy Library

MASSACHUSETTS ELECTED OFFICIALS

Speaker of the House Thomas Finneran
Senate President Thomas Birmingham
Representative Bruce Ayers, First Norfolk
Representative Vinny deMacedo, First Plymouth
Representative Paul Haley, Fourth Norfolk
Senator Robert Hedlund, Plymouth and Norfolk
Senator Stephen Lynch, First Suffolk
Senator Michael Morrissey, Norfolk and Plymouth
Representative Mary Jeanette Murray, Third Plymouth
Representative Stephen Tobin, Second Norfolk

COMMONWEALTH OF MASSACHUSETTS AGENCIES

Commission on Indian Affairs
Department of Environmental Management
Department of Environmental Protection

Department of Fisheries, Wildlife and Environmental
Law Enforcement
Division of Marine Fisheries
Executive Office of Environmental Affairs
Massachusetts Port Authority
Massachusetts State Police
Massachusetts Water Resources Authority
Metropolitan District Commission
Natural Heritage and Endangered Species Program
State Historic Preservation Office

AMERICAN INDIAN TRIBES

Delaware Tribe of Western Oklahoma
Delaware Tribe of Indians (Bartlesville)
Mashantucket-Pequot Tribal Nation
Mohegan Indian Tribe of Connecticut
Stockbridge-Munsee Tribe of Mohican Indians
Muhheconneuk Intertribal Committee on Deer Island
Narragansett Indian Tribe
Penobscot Nation
Wabanaki Tribes of Maine
Wampanoag Tribe of Aquinnah (Gay Head)
Other culturally associated tribes

LOCAL AGENCIES

City of Boston
Office of Environmental Services
Parks & Recreation Department
Boston Redevelopment Authority
City of Chelsea
Town of Hingham
Town of Hull
City of Lynn
City of Quincy
City of Revere
City of Salem
Town of Weymouth
Town of Winthrop

ORGANIZATIONS

Appalachian Mountain Club (AMC)
Beacon Management Company
Bosport Docking, LLC Constitution Marina
The Boston Harbor Association
Conservation Law Foundation
Environmental Diversity Forum
Environmental Lobby of Massachusetts
Friends of the Boston Harbor Islands
Friends of the Lightship Nantucket

Fort Revere Park and Preservation Society
 Greater Boston Convention and Visitors Bureau
 Hull Chamber of Commerce
 Hull Lifesaving Museum
 Jones Hill Neighborhood Association
 Massachusetts Bay Education Alliance
 Massachusetts Marine Educators
 Metropolitan Area Planning Council (MAPC)
 National Parks and Conservation Association (NPCA)
 New England Aquarium
 Roxbury Multi-Service Center
 Save the Harbor/Save the Bay
 Seaside Environmental Alliance
 Sierra Club
 Urban Harbors Institute,
 University of Massachusetts, Boston

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 James Doolin, Massachusetts Port Authority – Vice-chair
 Kathy Abbott, Island Alliance
 Larry Childs, Thompson Island Outward Bound
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 Marianne Connolly, Massachusetts Water Resources
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 Diane Haynes, Department of Environmental
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 Tom Lindberg, Boston Harbor Islands Advisory
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 Barbara Mackey, National Park Service
 Cmdr. Dan May, U.S. Coast Guard
 George Marsh, Friends of the Boston Harbor Islands
 Karen O'Donnell, Friends of the
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 Joe Orfant, Metropolitan District Commission
 Sarah Peskin, National Park Service
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 Lisa Vernegaard, The Trustees of Reservations
 Jack Wiggan, Boston Harbor Islands Advisory Council
 Eileen Woodford, National Parks and Conservation
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 Recreation Department

NPS PLANNING TEAM

Team

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 – Team Leader
 Daniel Boyd, Planning Assistant,
 Boston Support Office
 Bruce Jacobson, Assistant Project Manager,
 Boston Harbor Islands
 John Kelly, Resource Planner, Boston Support Office
 Sarah Peskin, Manager, Planning & Legislation,
 Boston Support Office
 George Price, Project Manager, Boston Harbor Islands
 Marjorie Smith, Landscape Architect,
 Boston Support Office

Resource Specialists

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 Robert Cook, Natural Resources Adviser
 Richard Crisson, Historical Architect
 Mary Foley, Regional Chief Scientist
 William Fuchs, Natural Resources Adviser
 Rebecca Joseph, Ethnographer
 Stephen Pendery, Archeologist
 Nigel Shaw, GIS Adviser
 Paul Weinbaum, Historian
 Nancy Woods, Public Affairs Adviser

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 Lehman Millet, Inc.
 Norris and Norris, Waterfront Planning &
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 Olmsted Center for Landscape Preservation, NPS
 Environmental Data Center, University of
 Rhode Island
 Volpe Center, U.S. Department of Transportation

NATIONAL PARK SERVICE NORTHEAST REGION

Marie Rust, Regional Director
 Chrysandra Walter, Deputy Regional Director
 Robert W. McIntosh, Associate Regional Director
 Terry W. Savage, Superintendent,
 Boston Support Office
 Sarah Peskin, Manager, Planning & Legislation,
 Boston Support Office

APPENDICES

APPENDIX 1: BOSTON HARBOR ISLANDS PARTNERSHIP AND ADVISORY COUNCIL

BOSTON HARBOR ISLANDS PARTNERSHIP MEMBERS AND ALTERNATES

National Park Service

Terry W. Savage, Superintendent, Boston Support Office
George Price, Project Manager, Boston Harbor Islands

U.S. Coast Guard

Captain Charles Beck, Commander,
U.S.C.G.: Group Boston
Commander Sue Bibeau

Department of Environmental Management

Peter C. Webber, Commissioner
Peter K. Lewenberg, Executive Office of Environmental
Affairs, Special Assistant for Boston Harbor Islands

Metropolitan District Commission

David Balfour, Commissioner
Brian Broderick, Director of Reservations and
Historic Sites

Massachusetts Port Authority

Louis A. Cabral, Special Liaison
James Doolin, Deputy Director of Urban Planning
and Design

Massachusetts Water Resources Authority

Robert Durand, Secretary, Executive Office of
Environmental Affairs and Chair, Massachusetts
Water Resources Authority
Douglas B. MacDonald, Executive Director

Boston Office of Environmental Services

Cathleen Douglas Stone, Special Assistant to the Mayor
Andrea d'Amato, Chief of Environmental Services and
Transportation

Boston Redevelopment Authority

Linda Mongelli Haar, Director of Planning
Paul McCann, Executive Assistant to the Director

Thompson Island Outward Bound Education Center

Alden I. Gifford, Trustee
George Armstrong, President

The Trustees of Reservations

Richard T. Howe, Director of Property Management
Lisa Vernegaard, Associate Director of Planning
and Ecology

Island Alliance

Maynard Goldman, President
Katherine Abbott, Executive Director

Boston Harbor Islands Advisory Council

Edith Andrews, Wampanoag Tribe of Gay Head
(Aquinnah)
Rob Moir, President, Save the Harbor/Save the Bay
Phil Lemnios, Town Manager, Town of Hull
Claudia Smith-Reid, Roxbury Multi-Service Center

BOSTON HARBOR ISLANDS ADVISORY COUNCIL MEMBERS

Boston Harbor Islands Related Advocacy Groups

Karen O'Donnell, Peddock's Island Association
Rob Moir, Save the Harbor/Save the Bay
Suzanne Gall Marsh, Volunteers & Friends of the
Boston Harbor Islands
Vivien Li, The Boston Harbor Association

Business and Commercial Interests

Peter Davidoff, Bosport Docking-Constitution Marina
Regina Burke, Hull Chamber of Commerce
Bernie Dreiblat, Combined Jewish Philanthropies
Greg Ketchen, New England Aquarium

Community Groups

Tom Lindberg, Jones Hill Neighborhood Association
Sha-King Alston, Environmental Diversity Forum
Claudia Smith Reid, Roxbury Multi-Service Center
Ed McCabe, Hull Lifesaving Museum

Education and Cultural Organizations

Sherman Morss, Jr., U.S.S. Constitution Museum
Mary Corcoran, Mass Bay Educational Alliance
Jack Wiggin, Urban Harbors Institute
Carl Johnson, South Boston High School

Environmental Organizations

John Lewis, Sierra Club
William D. Giezantanner, Appalachian Mountain Club
Seth Kaplan, Conservation Law Foundation
John Dinga, Massachusetts Marine Educators

Municipalities

Bernice Mader, City of Quincy
David Calnan, Town of Hingham
Phil Lemnios, Town of Hull
Joe Ferrino, Town of Winthrop

Native American Interests

Edith Andrews, Wampanoag Tribe of Gay Head (Aquinnah)
John Sam Sapiel, Penobscot Nation
Lawrence Snake, Delaware Tribe of Western Oklahoma
(Anadarko)
Steve Comer, Stockbridge-Munsee Band of Mohican Indians

APPENDIX 2: FEDERAL LAWS

P.L.104-333

Omnibus Parks and Public Lands Management Act of 1996. Signed 11/12/96

SEC. 1029. BOSTON HARBOR ISLANDS RECREATION AREA.

- (a) PURPOSES- The purposes of this section are—
- (1) to preserve for public use and enjoyment the lands and waters that comprise the Boston Harbor Islands National Recreation Area;
 - (2) to manage the recreation area in partnership with the private sector, the Commonwealth of Massachusetts, municipalities surrounding Massachusetts and Cape Cod Bays, the Thompson Island Outward Bound Education Center, and Trustees of Reservations, and with historical, business, cultural, civic, recreational and tourism organizations;
 - (3) to improve access to the Boston Harbor Islands through the use of public water transportation; and
 - (4) to provide education and visitor information programs to increase public understanding of and appreciation for the natural and cultural resources of the Boston Harbor Islands, including the history of Native American use and involvement.
- (b) DEFINITIONS- For the purposes of this section—
- (1) the term recreation area means the Boston Harbor Islands National Recreation Area established by subsection (c); and
 - (2) the term ‘Secretary’ means the Secretary of the Interior.
- (c) Boston Harbor Islands National Recreation Area-
- (1) ESTABLISHMENT-In order to preserve for the benefit and inspiration of the people of the United States as a national recreation area certain lands located in Massachusetts Bay, there is established as a unit of the National Park System the Boston Harbor Islands National Recreation Area.
 - (2) BOUNDARIES- (A) The recreation area shall be comprised of the lands, waters, and submerged lands generally depicted on the map entitled ‘Proposed Boston Harbor Islands NRA’, numbered BOHA 80,002, and dated September 1996. Such map shall be on file and available for public inspection in the appropriate offices of the National Park Service. After advising the Committee on Resources of the House of Representatives and the Committee on Energy and Natural Resources of the Senate, in writing, the Secretary may make minor revisions of the boundaries of the recreation area when necessary by publication of a revised drawing or other boundary description in the Federal Register.
 - (B) The recreation area shall include the following:
 - (i) The areas depicted on the map reference in subparagraph (A).
 - (ii) Landside points required for access, visitor services, and administration in the city of Boston along its Harborwalk and at Long Wharf, Fan Pier, John F. Kennedy Library, and the Custom House; Charlestown Navy Yard; Old Northern Avenue Bridge; the city of Quincy at Squantum Point/Marina Bay, the Fore River Shipyard, and Town River; the Town of Hingham at Hewitt’s Cove; the Town of Hull; the city of Salem at Salem National Historic Site; and the city of Lynn at the Heritage State Park.
- (d) ADMINISTRATION OF RECREATION AREA-
- (1) IN GENERAL- The recreation area shall be administered in partnership by the Secretary, the Commonwealth of Massachusetts, City of Boston and its applicable subdivisions and others in accordance with the provisions of law generally applicable to units of the National Park System, including the Act entitled ‘An Act to establish a National Park Service, and for other purposes’, approved August 25, 1916 (39 Stat. 535; 16 U.S.C. 1, 2, 3, and 4), and the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461-467) as amended and supplemented and in accordance with the integrated management plan specified in subsection (f).
 - (2) STATE AND LOCAL JURISDICTION- Nothing in this section shall be construed to diminish, enlarge, or modify any right of the Commonwealth of Massachusetts or any political subdivision thereof, to exercise civil and criminal jurisdiction or to carry out State laws, rules, and regulations within the recreation area, including those relating to fish and wildlife, or to tax persons, corporations, franchises, or private property on the lands and waters included in the recreation area.
 - (3) COOPERATIVE AGREEMENTS- The Secretary may consult and enter into cooperative agreements

with the Commonwealth of Massachusetts or its political subdivisions to acquire from and provide to the Commonwealth or its political subdivisions goods and services to be used in the cooperative management of lands within the recreation area, if the Secretary determines that appropriations for that purpose are available and the agreement is in the best interest of the United States.

(4) CONSTRUCTION OF FACILITIES ON NON-FEDERAL LANDS- In order to facilitate the administration of the recreation area, the Secretary is authorized, subject to the appropriation of necessary funds in advance, to construct essential administrative or visitor use facilities on non-Federal public lands within the recreation area. Such facilities and the use thereof shall be in conformance with applicable plans

(5) OTHER PROPERTY, FUNDS, AND SERVICES- The Secretary may accept and use donated funds, property, and services to carry out this section.

(6) RELATIONSHIP OF RECREATION AREA TO BOSTON-LOGAN INTERNATIONAL AIRPORT- With respect to the recreation area, the present and future maintenance, operation, improvement and use of Boston-Logan International Airport and associated flight patterns from time to time in effect shall not be deemed to constitute the use of publicly owned land of a public park, recreation area, or other resource within the meaning of section 303(c) of title 49, United States Code, and shall not be deemed to have a significant effect on natural, scenic, and recreation assets within the meaning of section 47101(h)(2) of title 49, United States Code.

(7) MANAGEMENT IN ACCORDANCE WITH INTEGRATED MANAGEMENT PLAN- The Secretary shall preserve, interpret, manage, and provide educational and recreational uses for the recreation area, in consultation with the owners and managers of lands in the recreation area, in accordance with the integrated management plan.

(c) Boston Harbor Islands Partnership Establishment-

(1) ESTABLISHMENT- There is hereby established the Boston Harbor Islands Partnership whose purpose shall be to coordinate the activities of Federal, State, and local authorities and the private sector in the development and implementation of an integrated resource management plan for the recreation area.

(2) MEMBERSHIP- The Partnership shall be composed of 13 members, as follows:

(A) One individual, appointed by the Secretary, to represent the National Park Service.

(B) One individual, appointed by the Secretary of Transportation, to represent the United States Coast Guard.

(C) Two individuals, appointed by the Secretary, after consideration of recommendations by the Governor of Massachusetts, to represent the Department of Environmental Management and the Metropolitan District Commission.

(D) One individual, appointed by the Secretary, after consideration of recommendations by the Chair, to represent the Massachusetts Port Authority.

(E) One individual, appointed by the Secretary, after consideration of recommendations by the Chair, to represent the Massachusetts Water Resources Authority.

(F) One individual, appointed by the Secretary, after consideration of recommendations by the Mayor of Boston, to represent the Office of Environmental Services of the City of Boston.

(G) One individual, appointed by the Secretary, after consideration of recommendations by the Chair, to represent the Boston Redevelopment Authority.

(H) One individual, appointed by the Secretary, after consideration of recommendations of the President of the Thompson Island Outward Bound Education Center, to represent the Center.

(I) One individual, appointed by the Secretary, after consideration of recommendations of the Chair, to represent the Trustees of Reservations.

(J) One individual, appointed by the Secretary, after consideration of recommendations of the President of the Island Alliance, to represent the Alliance, a nonprofit organization whose sole purpose is to provide financial support for the Boston Harbor Islands National Recreation Area.

(K) Two individuals, appointed by the Secretary, to represent the Boston Harbor Islands Advisory Council, established in subsection (g).

(3) TERMS OF OFFICE; REAPPOINTMENT- (A) Members of the Partnership shall serve for terms of three years. Any member may be reappointed for one additional 3-year term.

(B) The Secretary shall appoint the first members of the Partnership within 30 days after the date on which the Secretary has received all of the recommendations for appointment pursuant to subsections (b) (3), (4), (5), (6), (7), (8), (9), and (10).

- (C) A member may serve after the expiration of his or her term until a successor has been appointed.
- (4) **COMPENSATION-** Members of the Partnership shall serve without pay, but while away from their homes or regular places of business in the performance of services for the Partnership, members shall be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in the Government service are allowed expenses under section 5703 of title 5, United States Code.
- (5) **ELECTION OF OFFICERS-** The Partnership shall elect one of its members as Chairperson and one as Vice Chairperson. The term of office of the Chairperson and Vice Chairperson shall be one year. The Vice Chairperson shall serve as chairperson in the absence of the Chairperson.
- (6) **VACANCY-** Any vacancy on the Partnership shall be filled in the same manner in which the original appointment was made.
- (7) **MEETINGS-** The Partnership shall meet at the call of the Chairperson or a majority of its members.
- (8) **QUORUM-** A majority of the Partnership shall constitute a quorum.
- (9) **STAFF OF THE PARTNERSHIP-** The Secretary shall provide the Partnership with such staff and technical assistance as the Secretary, after consultation with the Partnership, considers appropriate to enable the Partnership to carry out its duties. The Secretary may accept the services of personnel detailed from the Commonwealth of Massachusetts, any political subdivision of the Commonwealth or any entity represented on the Partnership.
- (10) **HEARINGS-** The Partnership may hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence as the Partnership may deem appropriate.
- (11) **DONATIONS-** Notwithstanding any other provision of law, the Partnership may seek and accept donations of funds, property, or services from individuals, foundations, corporations, and other private and public entities for the purpose of carrying out this section.
- (12) **USE OF FUNDS TO OBTAIN MONEY-** The Partnership may use its funds to obtain money from any source under any program or law requiring the recipient of such money to make a contribution in order to receive such money.
- (13) **MAILS-** The Partnership may use the United States mails in the same manner and upon the same conditions as other departments and agencies of the United States.
- (14) **OBTAINING PROPERTY-** The Partnership may obtain by purchase, rental, donation, or otherwise, such property, facilities, and services as may be needed to carry out its duties, except that the Partnership may not acquire any real property or interest in real property.
- (15) **COOPERATIVE AGREEMENTS-** For purposes of carrying out the plan described in subsection (f), the Partnership may enter into cooperative agreements with the Commonwealth of Massachusetts, any political subdivision thereof, or with any organization or person.

(f) **Integrated Resource Management Plan-**

- (1) **IN GENERAL-** Within three years after the date of enactment of this Act, the Partnership shall submit to the Secretary a management plan for the recreation area to be developed and implemented by the Partnership.
- (2) **CONTENTS OF PLAN-** The plan shall include (but not be limited to) each of the following:
- (A) A program providing for coordinated administration of the recreation area with proposed assignment of responsibilities to the appropriate governmental unit at the Federal, State, and local levels, and nonprofit organizations, including each of the following:
- (i) A plan to finance and support the public improvements and services recommended in the plan, including allocation of non-Federal matching requirements set forth in subsection (h)(2) and a delineation of profit sector roles and responsibilities.
 - (ii) A program for the coordination and consolidation, to the extent feasible, of activities that may be carried out by Federal, State, and local agencies having jurisdiction over land and waters within the recreation area, including planning and regulatory responsibilities.
- (B) Policies and programs for the following purposes:
- (i) Enhancing public outdoor recreational opportunities in the recreation area.
 - (ii) Conserving, protecting, and maintaining the scenic, historical, cultural, natural and scientific values of the islands.
 - (iii) Developing educational opportunities in the recreation area.

(iv) Enhancing public access to the Islands, including development of transportation networks.

(v) Identifying potential sources of revenue from programs or activities carried out within the recreation area.

(vi) Protecting and preserving Native American burial grounds connected with the King Philip's War internment period and other periods.

(C) A policy statement that recognizes existing economic activities within the recreation area.

(3) DEVELOPMENT OF PLAN- In developing the plan, the Partnership shall—

(A) consult on a regular basis with appropriate officials of any local government or Federal or State agency which has jurisdiction over lands and waters within the recreation area;

(B) consult with interested conservation, business, professional, and citizen organizations; and

(C) conduct public hearings or meetings for the purposes of providing interested persons with the opportunity to testify with respect to matters to be addressed by the plan.

(4) APPROVAL OF PLAN-

(A) The Partnership shall submit the plan to the Governor of Massachusetts for review. The Governor shall have 90 days to review and make any recommendations. After considering the Governor's recommendations, the Partnership shall submit the plan to the Secretary, who shall approve or disapprove the plan within 90 days. In reviewing the plan the Secretary shall consider each of the following:

(i) The adequacy of public participation.

(ii) Assurances of plan implementation from State and local officials.

(iii) The adequacy of regulatory and financial tools that are in place to implement the plan.

(B) If the Secretary disapproves the plan, the Secretary shall within 60 days after the date of such disapproval, advise the Partnership in writing of the reasons therefore, together with recommendations for revision. Within 90 days of receipt of such notice of disapproval, the Partnership shall revise and resubmit the plan to the Secretary who shall approve or disapprove the revision within 60 days.

(5) INTERIM PROGRAM- Prior to adoption of the Partnership's plan, the Secretary and the Partnership shall assist the owners and managers of lands and waters within the recreation area to ensure that existing programs, services, and activities that promote the purposes of this section are supported.

(g) BOSTON HARBOR ISLANDS ADVISORY COUNCIL-

(1) ESTABLISHMENT- The Secretary, acting through the Director of the National Park Service, shall establish an advisory committee to be known as the Boston Harbor Islands Advisory Council. The purpose of the Advisory Council shall be to represent various groups with interests in the recreation area and make recommendations to the Boston Harbor Islands Partnership on issues related to the development and implementation of the integrated resource management plan developed under subsection (f). The Advisory Council is encouraged to establish committees relating to specific recreation area management issues, including (but not limited to) education, tourism, transportation, natural resources, cultural and historic resources, and revenue raising activities. Participation on any such committee shall not be limited to members of the Advisory Council.

(2) MEMBERSHIP- The Advisory Council shall consist of not fewer than 18 individuals, to be appointed by the Secretary, acting through the Director of the National Park Service. The Secretary shall appoint no fewer than three individuals to represent each of the following categories of entities: municipalities; educational and cultural institutions; environmental organizations; business and commercial entities, including those related to transportation, tourism and the maritime industry; and Boston Harbor-related advocacy organizations; and organizations representing Native American interests.

(3) PROCEDURES- Each meeting of the Advisory Council and its committees shall be open to the public.

(4) FACA- The provisions of section 14 of the Federal Advisory Committee Act (5 U.S.C. App.), are hereby waived with respect to the Advisory Council.

(h) AUTHORIZATION OF APPROPRIATIONS-

(1) IN GENERAL- There are authorized to be appropriated such sums as may be necessary to carry out this section, provided that no funds may be appropriated for land acquisition.

(2) MATCHING REQUIREMENT- Amounts appropriated in any fiscal year to carry out this section may only be expended on a matching basis in a ratio of at least three non-Federal dollars to every Federal dollar. The non-Federal share of the match may be in the form of cash, services, or in-kind contributions, fairly valued.

P.L. 106-176

Omnibus Parks Technical Corrections Act of 2000. H.R. 149, Signed 3/10/00

SEC. 126. BOSTON HARBOR ISLANDS NATIONAL RECREATION AREA.

Section 1029 of division I of the Omnibus Parks Act (110 Stat. 4232; 16 U.S.C. 460kkk) is amended as follows:

- (1) In the section heading, by striking 'recreation area' and inserting 'national recreation area'.
- (2) In subsection (b)(1), by inserting quotation marks around the term 'recreation area'.
- (3) In subsection (e)(3)(B), by striking 'subsections (b)(3), (4), (5), (6), (7), (8), (9), and (10).' and inserting 'subparagraphs (C), (D), (E), (F), (G), (H), (I), and (J) of paragraph (2).'
- (4) In subsection (f)(2)(A)(i), by striking 'profit sector roles' and inserting 'private-sector roles'.
- (5) In subsection (g)(1), by striking 'and revenue raising activities.' and inserting 'and revenue-raising activities.'
- (6) In subsection (h)(2), by striking 'ration' and inserting 'ratio'.

P.L. 105-355

TITLE I—AUTOMOBILE NATIONAL HERITAGE AREA OF MICHIGAN

SEC. 513. LAND ACQUISITION, BOSTON HARBOR ISLANDS RECREATION AREA. Signed 11/6/98

Section 1029(c) of division I of the Omnibus Parks and Public Lands Management Act of 1996 (Public Law 104-333; 110 Stat. 4233; 16 U.S.C. 460kkk(c)) is amended by adding at the end the following new paragraph:

- (3) LAND ACQUISITION- Notwithstanding subsection (h), the Secretary is authorized to acquire, in partnership with other entities, a less than fee interest in lands at Thompson Island within the recreation area. The Secretary may acquire the lands only by donation, purchase with donated or appropriated funds, or by exchange.'

P.L. 102-525

TITLE V—BOSTON HARBOR ISLANDS STUDY

SEC. 501. BOSTON HARBOR ISLANDS STUDY. Signed 10/26/92

(a) IN GENERAL- The Secretary of the Interior shall, within 1 year after the date of the enactment of this title, conduct a study of the Boston Harbor Islands to assess the opportunities for the National Park Service to contribute to State, regional, and local efforts to promote the conservation of the Boston Harbor Islands and their use and enjoyment by the public. In conducting the study, the Secretary shall—

- (1) consult closely with and explore means for expanded cooperation with the Massachusetts Department of Environmental Management, the Metropolitan District Commission, and the City of Boston;
- (2) evaluate the suitability of establishing the Boston Harbor Islands as a unit of the National Park System;
- (3) assess the opportunities for expanded tourism, public education, and visibility by managing the Boston Harbor Islands in conjunction with units of the National Park System in the vicinity, including the Adams National Historic Site in Quincy, Massachusetts; and
- (4) evaluate the possibility for developing ferry service and other transportation links among those units to enhance their public use and enjoyment.

(b) REPORT- The Secretary of the Interior shall submit to the Congress a report on the findings, conclusions, and recommendations of the study under subsection (a), by not later than 1 year after the date of the enactment of this title.

APPENDIX 3: THE ISLANDS OF BOSTON HARBOR

The following island descriptions are based on the Boston Harbor Islands Report of a Special Resource Study, 1994 by the National Park Service. Each island's managing agency is identified in parentheses.

Bumpkin Island (DEM)

Thirty-five acres in area, Bumpkin Island was used by fishing and farming people from the 1600s. It was farmed until 1682, when its owner, Samuel Ward, donated it to Harvard College. The island was apparently used as a place to dry fish and farm in the 1800s, and in 1901 a hospital for paraplegic children was located on top of the island's drumlin. In 1917, the U.S. Navy was given use of the island and built barracks for some 1300 sailors there the next year; the 58-building complex was razed after the war.

The stone foundations of a farmhouse, the ruins of the children's hospital, and a derelict orchard remain today as evidence of the human uses of the island. There are twelve campsites, three picnic areas, hiking trails, and wooded areas but no potable water on the island. Bumpkin has a dock and is served by the water shuttle. The island is owned by the state and managed by DEM.

Button Island (Town of Hingham)

One of the Hingham Harbor Islands, Button is less than one acre in area, and its rocky shoreline makes it difficult to approach by boat.

Calf Island (DEM)

A 17-acre island north of Great Brewster, Calf Island was for some years home to a colony of lobster fishermen and is the site of a spot called "the Lonely Grave," where fishermen are said to have buried shipwreck victims. Illegal boxing matches were also allegedly staged here on summer Sundays. In 1902 Benjamin P. Cheney and his wife, the actress Julia Arthur, built a large estate on a cliff overlooking the southeastern shore. The mansion and boathouse were destroyed by fire after World War II; only one chimney is still standing.

Calf Island has a brackish pond and tidal marshes, as well as wild cherry, beach plum, tall grasses, and wildflowers. There is no dock, and access is discouraged.

Deer Island (MWRA)

Deer Island's human history is nearly as varied as that of Long Island. Nearly a mile long and 210 acres in area, it is the second-largest island in the harbor. Farmed in the 1700s, it is said to have acquired its name from the fact that mainland wolves drove deer to the island across Shirley Gut, a channel that was filled in 1936. Hunters thus favored the island from an early time, at least until

Colonial-era lumbering left the island largely deforested. During King Philip's War (c. 1675), Deer Island was used as an internment camp for American Indians captured in the war. The island was fortified in World War II.

In the early 19th century Deer Island was a popular summer resort, but an 1847 outbreak of smallpox prompted the creation of a quarantine hospital here. In 1858, this facility became the House of Reformation, for delinquent young boys; in 1896 it was again reconstituted as the Suffolk County House of Corrections. Used until just recently, the facility was relocated to the South Bay area to accommodate the current expansion of the Massachusetts Water Resources Authority (MWRA) sewage treatment plant.

The MWRA plant is the most recent of a series of wastewater facilities that have been located on the island since 1889. In that year, a sewage pumping station was installed next to the House of Reformation. By the 1950s, the station was modified to treat sewage, and in 1968 the Metropolitan District Commission (MDC), predecessor agency to MWRA, expanded the facility to serve as the main treatment plant for the 43 cities and towns embraced by the authority. When the Boston Harbor Project was initiated in 1985, Boston transferred ownership of Deer Island to MWRA. The Deer Island facility will be the largest sewage treatment plant in New England when construction is complete in 2001.

Connected by land to the town of Winthrop, Deer Island consisted of two drumlins. The one in the center of the island was leveled for the first treatment plant; in the current expansion, the hill was shifted to the north side of the island to create a buffer that would mitigate the impacts of plant construction and operation. From this hill, visitors to the island will once again be able to see the town of Winthrop. Ring-necked pheasants, red-winged blackbirds, and other songbirds populate the island.

Gallop's Island (DEM)

Just west of George's and Lovell's islands, Gallop's Island is named for Captain John Gallop and was farmed in the 1700s and early 1800s. The 16-acre island, comprised of a high drumlin surrounded by shrubs and trees, was in the 1830s a popular summer resort with an inn and restaurant, whose trade was perhaps enhanced by the island's romantic association with pirates. Harbor historian Edward Rowe Snow claimed that the pirate Long Ben Avery buried a fabulous treasure of diamonds on the island. Just north of Gallop's on Nix's Mate (a channel marker that once was an island), pirates are said to have been hung from chains before being buried as a warning against illegal maritime activity.

Gallop's Island's resort years ended in 1866 when it became first a Civil War camp, and then the new site of the quarantine station that had earlier operated on Deer Island. Then, in 1916, the United States Public Health Service established an immigration station on the island to process thousands of immigrants entering the United States through Boston. During the Second World War, a U.S. Maritime Radio School occupied Gallop's Island; foundations of both can still be seen. In 1947, the federal government sold the island at public auction, and for some time it served as a dump for building debris.

Gallop's is served by the water shuttle. A public dock is open during the summer season. The island features a sandy beach, and visitors find impressive views of Boston Light and the city skyline from its grassy bluffs. There are trails, picnic areas, and composting toilets, but no water is available.

George's Island (MDC)

Granted to James Pemberton in the 1600s, George's Island is significant largely for its strategic location, just south of the main ship channel in Boston Harbor and just north of the shipping channel known as Nantasket Roads. Its position may explain why the 28-acre island became a federal property in 1825 and why, eight years later, Fort Warren was built on it.

Today, the island is largely occupied by the fort, a partially restored National Historic Landmark. During the Civil War, Union soldiers were trained here and Confederate soldiers imprisoned. Historian Edward Rowe Snow has asserted that Fort Warren "has more memories of the Civil War days than any other place in New England." Another historian has claimed that soldiers working on the fort's parade ground invented the lyrics to "John Brown's Body." Set to the tune of a popular hymn, the song was so popular among Union troops that President Lincoln is alleged to have asked Julia Ward Howe to write a patriotic poem to the same melody, what became "The Battle Hymn of the Republic."

Today, George's Island is the centerpiece of the 16 islands that form Boston Harbor Islands State Park. Seven miles from downtown Boston, the island contains the park's visitor center, a large dock, picnic grounds, and a gravel beach. It is operated for the state by the Metropolitan District Commission and accessible by passenger ferry from Long Wharf, Hewitts Cove in Hingham, and Lynn.

Grape Island (DEM)

Native Americans are said to have favored the tidal flats of this 50-acre island for shellfishing. Archeologists have discovered middens on Grape Island. Known for its abundant grapes in Colonial times, the island was the site of a Revolutionary skirmish known as the Battle of Grape Island.

Just 500 yards from the mainland at Weymouth, the island is essentially two large drumlins, one of them more than 70 feet above sea level, with widely different topography at each end. One flat-topped drumlin ends in rock outcroppings at the northern end; the southern end is a gradual slope with tidal salt marshes and swimming beaches. This low-lying southern end features a thick cover of bayberry and blackberry shrubs that support a large population of songbirds. There are also wooded areas and excellent views of the mainland; thus the island is popular with runners and hikers. Grape Island offers picnic areas, campsites, trails, and the remains of a farmhouse, and it is accessible by water shuttle during the summer season.

The Graves (U.S. Coast Guard)

The one-acre island known as The Graves has been home to the harbor's outermost lighthouse since the turn of this century. After Broad Sound Passage had been deepened to improve navigation, Graves Light was built on a rocky ledge overlooking the channel. The island is named for the 17th-century admiral Thomas Graves, but it is popularly associated with the "watery graves" surrounding it from numerous shipwrecks on and near its jagged rocks. Although shipwrecks may have been more numerous around Boston Light, the disasters at The Graves were often more dramatic. In 1938, the wreck of the *City of Salisbury*, a freighter carrying animals, inspired tourists throughout the summer to come and inspect the remains of the "zoo ship." Three years later, 18 of the 23 crew members of the fishing schooner *Mary E. O'Hara* perished after the vessel suddenly went down in 40 feet of water. The crew had climbed the masts, which remained above water, but during the cold night most dropped into the sea as their frozen hands could no longer sustain a grip. Only five survived.

The Graves is now the site of an automated lighthouse operated by the U.S. Coast Guard.

Great Brewster (DEM)

At 23 acres, Great Brewster is the largest of the nine islands in the Brewster chain and the only one of this group with a drumlin. This central drumlin rises about 100 feet above sea level. Deeply eroded ledges and a small drumlin mark the southern end of the island, and a salt marsh occupies the middle. Farming may have taken place on the island, and in the mid-1800s it was protected by a federally funded sea wall, parts of which are eroded today.

It has been asserted that the town of Hull built a lighthouse on Great Brewster in 1681, fully 35 years before Boston Light was built. With its command of the outer harbor and broad views of distant points, Great Brewster also served as a command post with a bomb- and chemical-proof system of bunkers in World War II; it also had strategic importance in the earlier world war.

Some wooded areas exist on Great Brewster, but the severe weather in this most exposed section of the harbor has made vegetation generally sparse. Sumac shrubs and a few larger trees grow, and open fields are full of wild roses. The island offers, however, tidal pools that abound in such marine life as periwinkles, blue mussels, barnacles, starfish, crabs, and sea anemones. The island is also home to a large gull colony. Great Brewster is currently not staffed for visitors, although visitors in private craft do beach or moor their boats.

Green Island (DEM)

Like its neighbor, Little Calf, Green Island is an outcropping of about an acre covered only with shrubs and grasses. Like Calf and Middle Brewster, the island is said to have been inhabited for some unspecified time by lobstermen, and local historian Snow asserted that a hermit lived here as well. The island takes its name from a merchant who owned it in Colonial times, and today it is a nesting site for gulls and cormorants. Public use of the island is discouraged.

Hangman Island (DEM)

This quarter-acre island of rock outcrop lies in the middle of Quincy Bay; it used to be much larger.

Langlee Island (Town of Hingham)

This four-acre island located at the mouth of Hingham Harbor features two sandy beaches and is a favorite picnicking place among boaters. The island has a rock formation called puddingstone, with shapes, sizes, and colors swirled together in such a way as to resemble a pudding.

Little Brewster (U.S. Coast Guard)

This four-acre island is best known as the home of Boston Light (1716), the first lighthouse to be built in the United States and the last to be staffed. A National Historic Landmark, the lighthouse flew the Union Jack each time it sighted an approaching ship—a signal to observers at Castle Island that the city should prepare its defenses. Today, Boston Light can be seen 27 miles away in clear weather. Three years after Boston Light was built, the colony installed a cannon on the island whose shot would guide ships in distress during thick fog. This cannon, the first fog signal in the Coast Guard, has recently been restored and returned to the small Coast Guard museum in the base of the lighthouse.

Various known as Lighthouse or Beacon Island, Little Brewster has a rugged shore of cliffs, ledges, and beach. The ocean-facing side of the island is eroding significantly. At low tide, a sandbar connects the small island to Great Brewster. On the island are the lighthouse keeper's three-bedroom house, a structure housing a

250-gallon cistern, two other small buildings, and a pier. Access is entirely by private vessel.

Little Calf Island (DEM)

Less than an acre in extent, Little Calf lies just 100 feet north of Calf Island. It is largely an outcropping of bedrock that provides nesting sites for cormorants, herring gulls, and black-backed gulls. DEM discourages recreational use of Little Calf.

Lovell's Island (MDC)

Located one-and-a-half miles from Deer Island and separated from Gallop's Island by the shipping channel called The Narrows, this 62-acre island is named for Captain William Lovell, an early settler of Dorchester. Used for agriculture in its earliest days, the island is best known for the shipwreck of the 74-gun French warship *Magnifique* that occurred off its inner shore in the 1700s. Lovell's Island was fortified before and during the First World War. Four gun batteries that predate the war and other military structures from the wartime outpost Fort Standish remain on the island.

Accessible by private craft and by public water shuttle from George's Island, Lovell's offers a supervised swimming beach, boat and fishing piers, picnic grounds, walking trails, permit camping, and public restrooms. It also features salt marshes, woods, meadows, and dunes.

Long Island (City of Boston)

The largest (214 acres) and longest (1.75 miles) of the Boston Harbor Islands, Long Island has an involved and varied human history. Archeologists believe that prehistoric habitation sites may exist on the island, which was occupied by some 40 tenant farming families beginning in 1634. Once densely forested, the island was largely cut over in Colonial times after Massachusetts Bay Colony legislators authorized lumbering on the islands in 1630. By the time of the Revolution, Yankee privateers established batteries on the island from which they destroyed one British transport.

Until the Civil War, however, the island appears to have been relatively quiet save the 1819 construction of Long Island Light. Then, in 1863, an artillery encampment was established on the island. Named Camp Wightman and renamed Fort Strong, it served as an important Civil War conscript center; near it lie the remains of 79 Civil War soldiers. Fort Strong did not again see major use until the First World War, when 500 soldiers were stationed there. Its guns obsolete by the next world war, Fort Strong was abandoned; though still standing, it is now in disrepair. In 1950, a Nike missile base was established on the island; after its abandonment, the base was used to store hundreds of thousands of books for the Boston Public Library.

During much of the 19th century, Long Island was a resort where illicit prize fights are said to have been staged. Mansions, more modest summer houses, and community centers were built on the island, and for about 30 years a colony of Portuguese fishermen lived there. Then, in 1882, the City of Boston acquired the island's largest resort hotel and by 1891 had converted it into a poorhouse for 650 people. So began more than a century of use of the island for dependent populations. In 1921 the almshouse was converted into a home and hospital for unwed mothers; seven years later an addition was built to house homeless men. In 1941 the facility was again enlarged to provide treatment for alcoholics. This 60-acre Long Island Chronic Care Hospital, administered by the city, the state, and a private nonprofit health-care group, included a 400-bed homeless shelter, a mental health extended-care facility for homeless people, and centers for the treatment of alcohol and drug abuse. Although the hospital is no longer in operation, the city operates drug and alcohol treatment programs, a homeless shelter, and several other human service programs on Long Island. The city is planning to build a facility to treat adolescents with drug and alcohol dependency, while it is also exploring ways to open the island's parade grounds and Long Island Head for pedestrians and bicyclists.

The island not only preserves evidence of some of its human past, but its natural features are also remarkable—three drumlins, dune beaches, open meadow, a saltwater marsh, and a dense pine grove on its southern side. Its wooded areas of fruit and poplar trees and sumac thickets make the island a favorite habitat for ring-necked pheasants, songbirds, and cottontail rabbits. Owned by city of Boston, Long Island is connected through the Squantum area of Quincy by causeway and to Moon Island by bridge.

Middle Brewster (DEM)

The least accessible of all the harbor islands, Middle Brewster was first settled by a colony of fishermen in the 1840s, and for many years its shores were considered a bountiful source of fish and lobsters. In the late 1800s, wealthy yachtsman Augustus Russ owned the island and built a summer home for himself on it; he also leased land to other seasonal residents. But its situation and topography—it is a high, 12-acre outcropping of ledge surrounded by underwater ledges and jagged stone invisible in high tide—made it less than welcoming, and it is today chiefly valued for its wildlife. Two species of heron have established rookeries on the island's southeast corner, and DEM discourages recreational uses there.

Moon Island (City of Boston)

Like many other harbor islands, Moon was originally used

for crops and livestock pasture. The 44-acre island was also the site of a Revolutionary skirmish. In 1878 it was selected to become home to what was then considered the most modern sewage treatment and disposal facility in the world. Here the City of Boston built a series of tunnels and massive granite settling tanks in the 1880s, which operated until the job was taken over by more advanced plants on Nut and Deer islands. Today, the old settling tanks cover almost half of the island, but from Moon Island's single drumlin visitors find excellent views of the city and the harbor. The island was put to other municipal uses in 1959 and 1960. First, on the northern end of the island, the Boston Fire Department built a facility that recreates different Boston rooftops for training firefighters; then the Boston Police Department set up a firing range on the southern end. This firing range is scheduled for expansion. The island is not open to the public.

Moon Island is connected to the mainland at the Squantum section of Quincy by a two-lane causeway and is linked by bridge to Long Island. The island offers a coarse-sand beach of some 52,000 square feet, and fauna include songbirds, squirrels, skunks, and other small animals. It is owned by the City of Boston.

Nix's Mate (U.S. Coast Guard)

What once was a 12-acre island is now a channel marker with a distinctive black-and-white-striped buoy built under the auspices of the Boston Marine Society. Legend ascribes a pirate warning to Nix's Mate: captured pirates were said to have been hung in Boston Common and displayed in chains on the island.

Nut Island (MWRA)

Originally only 4 acres, Nut Island became a 17-acre peninsula when the shallow waters between it and Quincy were filled. It is now the end of the arm that separates Quincy and Hingham bays.

In Colonial times, Nut Island was apparently used to pasture cattle, which were driven back to the mainland over sandbars at low tide. In 1876, a local foundry used the island to test ordnance; 15-inch guns were installed here to shoot projectiles as heavy as 500 pounds at targets on the island. By the end of the 19th century, the Metropolitan District Commission assumed control of Nut Island and established a sewage treatment plant, now outmoded and scheduled for removal. A new headworks, which screens large objects, sand, and gravel from wastewater, will be built on Nut Island; here too are facilities to capture such floatable pollutants as grease, oil, and plastics. On completion of the project, Nut Island will also have a small park.

Outer Brewster Island (DEM)

Outer Brewster Island is a treeless, grass- and brush-covered island of 17.5 acres. It is the largest outcrop of

solid bedrock in Boston Harbor, a fact that motivated its owner, Nathaniel Austin, and his son to open and operate a paving stone quarry on the northeast end of the island in the early 19th century. Otherwise, until the Second World War, the island stood mostly undisturbed. In 1941, the U.S. Army built an installation here known as Battery Jewell, a bomb- and chemical-proof enclosure holding radar-controlled guns and ammunition storage chambers. There were also barracks for 125 men and a desalinization plant at the battery, deactivated in 1946.

On the northwest end is Pulpit Rock, so named for the sermon-like sound the wind makes as it sweeps over its flat top. Visitation is discouraged.

Peddock's Island (MDC)

The third-largest (188 acres) of the Boston Harbor Islands, Peddock's Island is a quarter of a mile from Hull across Hull Gut. It has the longest shoreline of any island in the harbor and is composed of five drumlins connected by sand or gravel bars called tombolos. It is one of few harbor islands to yield evidence of possible prehistoric habitation (as opposed to simple use): in the late 1960s, a summer resident digging in her garden unearthed a male skeleton that carbon dating established to be 4,100 years old. It is the oldest skeleton ever found in New England. Peddock's, unlike nearly every other island in Boston Harbor, remains inhabited; it is the only one with a year-round population (albeit small; only two people live here), and numerous families still summer on Peddock's, even though it has no telephones or electricity. There is still a chapel on the island.

Peddock's Island had been used by farmers since 1634, when it was granted to Charlestown. But its proximity to the mainland gave it a prominent military role. It is said to have been the site of a patriot infantrymen's raid on a Loyalist farm; 800 cattle and sheep were confiscated from the island farm and taken to the mainland. In 1776, some 600 Patriot militiamen were stationed on the island to guard the harbor against the return of British troops.

In 1900, the federal government built Fort Andrews on Peddock's Island; it is likely eligible for the National Register. Today, 26 structures, including guardhouses, prisoner-of-war barracks, stables, a gymnasium, and a firehouse, stand in various states of disrepair on an 88-acre site on the island's east head.

The island with its fort is owned by the state and managed by MDC, the island features varied environments. On its east head are dense woods of maple, pine, apple, cottonwood, and birch. A popular sand spit beach with dunes, beach plums, and wild roses is in the middle of the island, and on the west end is a salt marsh with marsh grass, cattails, and milkweed. Camping is allowed by permit only, and people use the

island for hiking and sightseeing. It has modest visitor facilities, including public toilets, and is accessible by public vessel.

Raccoon Island (DEM)

Located just off Hough's Neck in Quincy, Raccoon Island is three acres of bedrock outcropping with one section rising about 30 feet above the harbor. Little human activity has been recorded on the island, although a religious order did operate a summer camp for boys there in the 1930s. Mudflats, gravel beaches, and rocky slopes provide a variety of habitats for wildlife. No public facilities exist on the island.

Ragged Island (Town of Hingham)

One of the Hingham Harbor Islands, the four-acre Ragged Island is supposed to have been named in the 17th century by John Langlee for his daughter Sarah's style of dressing, and it was the island he chose for his family to live on. It is the only Hingham Harbor island that has ever been inhabited. Ragged Island was once connected to the mainland by a footbridge, and, in 1880, a restaurant and observation post were built here. They are no longer standing. Like nearby Langlee Island, Ragged Island is popular for picnicking.

Rainsford Island (City of Boston)

Owned by the City of Boston, Rainsford Island is 11 acres composed of a large east head and small west head connected by a sand spit. It was named for one of the earliest recorded settlers, Edward Rainsford, who had a farm there as early as 1636. In 1737, a facility to quarantine persons with smallpox and other infectious diseases was moved there from Spectacle Island, and hundreds of victims are thought to be buried in the island's cemetery. The quarantine facility operated as needed until 1852, and when no communicable disease afflicted Boston and its environs an inn was permitted to operate on Rainsford.

In 1852, the Commonwealth purchased the quarantine hospital with an eye toward creating an almshouse; then, in 1866, the City of Boston bought the facility and converted it into a municipal poorhouse. After the Civil War, a number of veterans lived on the island until their transfer to the Soldiers' Home in Chelsea in the 1880s. The island then became a home first for female paupers and then for delinquent boys. This last incarnation, the Suffolk School for Boys, was closed in the 1920s and its students transferred to reformatories in Shirley, Westborough, and other towns.

Rainsford Island today is largely open field with a small stand of hardwoods on its east head (a drumlin) and slate outcroppings, relatively rare on the harbor islands, on the west head. There are ruins of its many institutions and

perhaps also of a fishing village that existed for a time on the island. It offers two curving fine-gravel beaches, but the constant pounding of ocean and northeastern winter storms has created a major erosion control problem. It is accessible to private boats. No water is available, and all trash must be carried off the island.

Sarah Island (Town of Hingham)

John Langlee is said to have been named this two-acre island for his daughter. Langlee purchased several of the Hingham Harbor islands in 1686.

Shag Rocks

This cluster of bedrock ledges among the Brewsters was hazardous to mariners. Today it contains bird nesting areas.

Sheep Island (DEM)

Sheep Island is said once to have embraced more than 25 acres. As its name suggests, early settlers used the island as sheep pasture, and in the 19th century it was popular with campers and duck hunters. Only a few feet above sea level, the island has been worn away to less than two acres by wind and water since settlement times. Located between Peddock's on the north and Grape Island on the south, the island is so small that recreational uses of it are discouraged.

Slate Island (DEM)

As its name indicates, this 12-acre island is basically a series of slate ledges. Beginning in the 1650s, the northwest side of the island was quarried for slate for the foundations of houses. Some sources state that the only 19th-century resident of the island was a hermit, but in the late 1930s a summer camp for boys was located here.

Slate Island is owned by the state and managed by DEM. Accessible only by private craft, the island has dense thickets of raspberry and barberry bushes and poison ivy. Walking trails allow visitors to see the remains of the 17th-century quarries.

Snake Island (Town of Winthrop)

Named for its serpentine shape, this two-acre island lies off Winthrop just east of Logan Airport. The island is mostly noteworthy for having escaped the fate of two other islands—Apple and Governor's—whose mudflats were incorporated into the Logan Airport runway system during in the 1950s. The island was first shown on a mariners' chart in the 1690s as Bare Island.

Spectacle Island (DEM and City of Boston)

Just west of Long and southeast of Castle Island, Spectacle Island got its name because its two drumlins, East and West Spectacle, are connected by a sandbar; at low tide, the island resembled a pair of eyeglasses. The

97-acre island was privately owned and used for agriculture in the 1660s, but in 1717 it became the site of a quarantine hospital for victims of infectious disease. Twenty years later the hospital was moved to Rainsford Island, and Spectacle became a summer resort with two hotels (and illegal gambling) in the 19th century. After 1857, this island was also the site of a factory that rendered dead horses for horsehair, hides, glue stock, bones, and neatsfoot oil.

The island's fortunes took another odd turn in the 1950s, when the City of Boston purchased it and began to fill its sandbar with municipal trash. The fill reached a depth of 70 feet before the dump was abandoned in 1959, and it gave the island its saddle shape. Discussion of possible future uses of the island was for a time tabled because of the need to stabilize the landfill and the island's seriously eroded eastern cliffs. With the announcement of plans to build a third tunnel under Boston Harbor to Logan International Airport and to depress the city's Central Artery, Spectacle was designated to receive fill from harbor dredges. The island's basic shape has once again been modified by the closing and capping of a former landfill and the creation of the highest peak in Boston Harbor. The island will feature a visitor center, marina, two sandy beaches, five miles of pathways, and 360-degree views of the city and the harbor (See Appendix 11.). The island is planned to be open to the public in 2002. It is now jointly owned by the city of Boston and the state, managed by DEM.

Thompson Island (Thompson Island Outward Bound Education Center)

One of two privately owned islands in the group (World's End is the other), Thompson Island is the site of the earliest documented European use of these islands. French traders had used the island, and in 1626 David Thompson built a post there to trade with the Neponset Indians. In 1833, the Boston Asylum for Boys was moved to the island, and in 1835 the asylum merged with the Boston Farm School Society to become the Boston Farm and Trade School. The vocational and farming emphasis of the school survived until the middle of this century, when a new academic curriculum stimulated another change of name to Thompson Academy.

At 157 acres one of the larger harbor islands, Thompson has a drumlin and a moraine; oak, linden, tamarack, maple, sumac, and birch trees; open fields with a variety of wildflowers and berry bushes; a pond; and 50 acres of saltwater marshes. A number of songbirds and shorebirds nest or roost on the island.

Today, owned and operated by Thompson Island Outward Bound Education Center, Thompson Island fulfills a vital educational role for children and adults from Boston and the surrounding metropolitan area. It is

the site of an Outward Bound program for inner-city youth that strives to bring together students of varying race, ethnicity, and class in an ambitious outdoor learning program. An estimated 32,000 people visit Thompson Island each year. The campus includes a residence hall housing 150 persons, an auditorium, a gymnasium, dining and conference areas, environmental study areas, a challenge adventure course, and trails. Thompson Island has a beach of more than 300,000 square feet, public bathrooms, boat and fishing piers, and a visitor information and education center; it is accessible by its own boat service.

World's End (The Trustees of Reservations)

Probably an island until recent times, World's End is a peninsula of some 248 acres and shares many of the features found on the harbor islands. Overlooking Hingham Bay, it is formed by two drumlins and has rocky beaches, ledges, cliffs, patches of salt marsh, and an area of freshwater marsh. Native Americans are thought to have camped on its two hills in the summer, and Europeans farmed the area from settlement times into the late 1800s. In 1890, John Brewer hired landscape architect Frederick Law Olmsted to draw up a park plan for his farm estate on World's End. Although the farm no longer exists, The Trustees of Reservations protects the land, and many of the original features of Olmsted's plan for the grounds, including gravel paths, formal tree plantings, and hedgerows bordering old farm fields, remain.

World's End offers trails for nature study (quail, pheasant, fox, rabbit, and migratory shorebirds thrive in its habitats), scenery, cross-country skiing, snowshoeing, fishing, and, by permit, horseback riding. A limited amount of parking is available, and an entrance fee is charged.

APPENDIX 4: SUMMARY OF PUBLIC INVOLVEMENT

From January through March 1998, the Partnership sponsored a series of seven public workshops throughout the region. They were attended by more than 400 people. The following summarizes the public comments recorded at these workshops.

ACCESS

Meeting participants called for easy, increased, affordable access to the Boston Harbor Islands. Participants envisioned a multi-modal transportation network—including mass transit, greenways, bikeways, ferries, water shuttles, and water taxis—connecting the region via various mainland access points dispersed around the harbor rim. They called for new and improved docks, public boat ramps, moorings, and handicapped-accessible piers to accommodate both a public water transit system, and increased use by private boaters. The public water transit system would provide frequent mainland and inter-island service to the larger, more environmentally stable islands while less frequent water shuttle service, kayaks, sailboats, wind surfers, and other pleasure craft could have access to the smaller, more environmentally sensitive islands. Participants specifically mentioned increasing public access to Long, Bumpkin, Peddock's, Great Brewster, Calf, and Moon islands.

DEVELOPMENT

"Modest is best," was the message that meeting participants sent to the planning team regarding development. Participants requested that the park partnership respect the scale of the islands when planning for new development, ensuring that any new construction fit well into the fragile island environment. While some participants felt that the partnership should allow no commercial development whatsoever, others explained that the partnership had to pursue some type of economic generators to support desired programs and services. Suggestions for development focused mainly on three islands: Long Island (a hotel, youth hostel, or restaurant), Spectacle Island (amphitheater, marina, or restaurant), and Peddock's Island (educational institution). Participants felt that the other islands should be kept as "natural" as possible, but with a few added perks, like: clean restrooms or outhouses; potable water; changing rooms; piers; "limited" overnight accommodations; food concessions (along with a non-franchise coffee shop); a bait shop; and a monument to the islands' initial occupants. To help keep on-island development to a minimum, participants suggested that the partnership consider harbor-side sites for facilities to support public use of the islands. Participants also

pointed out the logic of using renewables—wind, sun, and the tides—as sources of energy for the islands.

CULTURAL RESOURCES

Meeting participants felt that the partnership should manage the Boston Harbor Islands in ways that are reflective of the islands' history, and respectful of their initial occupants. Participants suggested that the lighthouses and other historic structures be stabilized and preserved, and that Fort Warren be fully restored to help tell the story of how the fort functioned historically. People recommended that the partnership build on the current preservation efforts of the Metropolitan District Commission and the Department of Environmental Management, and work with Boston historical societies and historians in planning for the islands.

NATURAL RESOURCES

A majority of meeting participants expressed a strong desire to preserve the natural aspects of the islands. Recognizing that some development would take place on certain islands, many participants suggested preserving the undeveloped islands in as natural a condition as possible. Others said that not all the islands need to be open to human activity and that some should be reserved for wildlife. Some comments focused on the need to designate bird sanctuaries to protect nesting sites. Participants also emphasized the protection of the islands' botanic resources and even suggested reestablishing vegetation that was present prior to European settlement. A number of people called for the continued protection of the waters and beaches of Boston Harbor, pointing out that motor boat traffic and pollution would increase with greater visitation.

USES

Many participants want to see the traditional recreational activities maintained and enhanced where possible. The most commonly identified activities included swimming, fishing, boating, kayaking, canoeing, camping, hiking/walking, and picnicking. Opinions both for and against hunting were expressed. The general perception is that the Boston Harbor Islands should provide a wide range and variety of resource-dependent recreational activities. Commercial activities should be avoided because of their inherent conflict with the natural setting. The islands should provide the public with recreational opportunities that suit all levels of income and sophistication. The programs should have an educational value, as well. Recreational opportunities should be

expanded seasonally to provide wintertime activities, such as cross-country skiing. Many participants suggested that the islands have overnight accommodations, with examples ranging from primitive campgrounds to cottages, bed-and-breakfasts, rustic inns, but not commercial hotel chains. The public identified Long Island, Peddock's, and Spectacle islands as potential locations for overnight use. Other participants suggested having summer camps for children and retreats for adults. The islands could also be used for special events such as sports competitions and concerts. Indians could use the islands to practice tribal ceremonies, and market crafts, and create an "Indian Cultural Center."

EXPERIENCES

Participants spoke of the many ways they value the islands. Visitors go to them for a sense of isolation and quiet, an opportunity for contemplation, for the feeling of discovery and adventure; they appreciate the individual character of each island, and enjoy the transitional zone the islands provide between the urban built environment and a more rugged natural world. Visitors also regard getting to the islands by boat as part of the experience they value. Most commenters would like to see the islands kept without too many intrusive "urban" elements such as commercial signs, amplified noise, and flush toilets. Some people appreciated that the islands were safe for children. One commenter spoke of the value to city children of being able to see the night sky.

EDUCATION, INTERPRETATION, PROGRAMS

Commenters placed strong emphasis on using islands as outdoor classrooms in which a range of topics and themes could be explored, such as natural and cultural history, geology, archeology, ethnology, American Indian culture, marine biology, maritime safety and protection, history of land use, energy sources (wind, solar, tidal), and the impacts of humans on the islands. Several people discussed the opportunity for teaching and employing the arts in island programming. Others talked about tapping the academic community and of research opportunities that could also be part of education programs; for example, the rise of sea level could be studied in connection with global warming. Themes of conservation and stewardship were highlighted, with suggestions about using these concepts in island management. The audiences for education programs could range from youth to elderly and include particular audiences such as disabled people, tourists, volunteers, and retired people. Some of the ways to carry out education and programming could be through: an education center; signs, displays and guidebooks; calendar of activities;

rangers and guides leading programs; nature walks; school field trips; after-school programs in the spring; job training and volunteer programs; "learning-by-doing"; and development of an Indian center at which people would learn firsthand about the Indian culture that used to predominate on the islands.

MARKETING

Of the few comments made about marketing, the main point was that the islands need to be better known or "advertised," both how to get to them and what visitors can do when they get there. Commenters noted that North Shore residents, especially, received little information about ferries from Lynn, and that advertising should also go to areas beyond the inner belt around Boston. Other groups that should be reached were Native Americans and visitors from around the country.

MANAGEMENT

The meeting participants identified a number of management issue themes. The emphasis of the comments focused on the proper and cooperative management of the islands to balance natural resource preservation and development while offering expanded services to the public. The islands should have community-based involvement in developing, managing, and marketing the islands. The public is concerned about the effectiveness of multi-agency management and suggests the cooperative and efficient use of agency resources. One participant described the national park area as a family of islands with individual personalities that should be taken into account when planning. Management decisions should be based on scientific data, such as natural resource inventories and carrying capacity studies. Participants recommended establishing strong ties between islands and mainland waterfront, and maximizing appropriate islands' natural and educational values, rather than developing the islands. The public stressed the overwhelming need for sufficient staffing for interpretation, protection, and maintenance. Many people suggested using volunteers and other creative alternatives to providing services without paid employees. The public would like to see more rangers and consistent visitor information with clear rules for public access and behavior. The participants are concerned about the potential for user conflicts, especially motorized versus non-motorized boaters. Another concern included increased trash problems, which the participants believed should be addressed by having more trash receptacles and "pack-it-in, pack-it-out" protocol where appropriate. The public would like to see the issue of the cottages on Peddock's Island resolved with their possible re-use for

public purposes. In general, the participants said they would like to have increased food, ferry, and program services throughout more of the year. Many people agreed that development connected with these services should be concentrated on only one or two of the islands, such as Spectacle and George's.

FINANCING

There was general recognition that a revenue stream will be needed in addition to public funding, especially because people seem to want, and assume there will be, more programs, better access, and heightened resource protection in the future. Beyond this commonality there was much divergent opinion about the proportion of public and private funding the degree of corporate sponsorship, and whether the main responsibility for funding should continue to be public funding, or whether strong efforts should go into seeking private funds. What is the degree of public commitment?, several people asked. A number of people suggested the need for guidelines for any private financing—such as prohibiting gambling, defining a desirable balance between having corporate funding and having too much commercialism, isolating commercial activity in certain areas to keep other areas “pristine.” Several methods of fund-raising were suggested, with various degrees of public and private sponsorship: user fees; concessions for boat moorings; a conference center, restaurants, and events; “adopt an island”; a tax check-off; license plates; bond issues; public interest fund-raisers to create an endowment fund. And, opportunities for funding exist not only on the islands but along the shore, it was pointed out.

APPENDIX 5: IMPLEMENTATION COSTS

The draft general management plan provides general policy direction. At this conceptual level of planning, attendant costs are approximate. The following implementation cost estimates are helpful in long-range planning, but will not be used for short-term budgeting purposes. These costs are only a general indication or characterization of potential capital and operating implementation costs.

All Partnership members, except the Advisory Council, would provide the funds to implement the general management plan. Federal funding would be matched in the ratio of one-to-three, federal-to-nonfederal dollars. Successful implementation of the plan is contingent upon increasing the financial contributions from private sources, raised primarily by the Island Alliance. Private funding would be expected to come from philanthropic and park-related revenues, use fees, and income from commercial operations. Public agencies would be expected to fund large infrastructure projects throughout the system.

The estimated cost for operating the park is \$8 million under any of the action alternatives. The differences between alternatives would be in the allocation of funds: under Alternatives A and C more funds would go to resource protection and fewer to education and interpretation than in Alternative B.

PLANS AND STUDIES

Managers require a basic level of knowledge about park resources and visitors, and fundamental plans must be developed to guide specific undertakings. Costs for plans and studies would be approximately \$4 million for any of the three alternatives, A, B, or C during implementation of the general management plan.

		TOTAL COST
NATURAL RESOURCE BASELINE		1,107,400
Natural Resource Inventory	1,052,400	
Vital Signs Study	55,000	
VISITOR USE		260,000
Management Area Carrying Capacity (VERP)	240,000	
Visitor Profiles	20,000	
CULTURAL RESOURCE BASELINE		1,455,000
Archeology Overview and Assessment	175,000	
Cultural Landscape Report	180,000	
Ethnographic Overview and Assessment	260,000	
Historic Resource Study	300,000	
Historic Structures Reports and Preservation Guides	280,000	
Landuse Study	75,000	
List of Classified Structures	90,000	
Park History	45,000	
Scope of Collections	50,000	

Plans and Studies chart continued on next page

continued

TOTAL COST

IMPLEMENTATION PLANS

1,235,000

Archeological Resources Management Plan	60,000
Collections Management Plan	40,000
Commercial Service Plan	75,000
Comprehensive Identity and Signage Plan	60,000
Comprehensive Interpretive Plan	20,000
Economic Plan	200,000
Fire Management Plan	15,000
Hazardous Materials Survey	65,000
Integrated Pest Management Plan	12,000
Invasive Plants Management Plan	15,000
Land and Water Transportation Plan	250,000
Land Protection Plan	8,000
Public Safety Plan	10,000
Resource Management Plan	25,000
Shoreline and Seawall Management Plan	45,000
Trail Management Plan	15,000
Vegetation Restoration Plan	15,000
Visitor Use Management Plan	45,000
Visitor Carrying Capacity Guidelines (VERP)	250,000
Wetland and Floodplain Protection Plan	10,000

TOTAL PLANS AND STUDIES

4,057,400

ANNUAL OPERATIONS

Anticipated operating expenditures would vary for the alternatives, within annual expenditures of approximately \$8 million. The differences would be in staffing costs that reflect the emphasis of Alternatives A and C on resource protection and the emphasis of Alternative B on dispersed recreational activities. Current annual operating expenses for the park are approximately \$4 million.

It is anticipated that a special initiative will be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island. The above operating cost estimates do not include costs associated with these special facilities; the facilities would be operated in collaboration with the private sector on a self-sustaining basis.

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
STAFFING			
Management	760,000	760,000	760,000
Planning	315,000	315,000	315,000
Resource Protection	1,520,000	885,000	1,520,000
Administration	630,000	630,000	630,000
Education & Interpretation	885,000	1,520,000	885,000
Maintenance	1,100,000	1,100,000	1,100,000
SUBTOTAL	5,210,000	5,210,000	5,210,000
OPERATIONS			
Vehicles/boats (includes depreciation)	1,500,000	1,500,000	1,500,000
General Maint. Equip	700,000	700,000	700,000
Equipment & Supplies	400,000	400,000	400,000
Office & Facilities Leases	500,000	500,000	500,000
SUBTOTAL	3,100,000	3,100,000	3,100,000
TOTAL STAFFING & OPERATIONS	8,310,000	8,310,000	8,310,000

INFRASTRUCTURE DEVELOPMENT

The alternatives outline broad conceptual-level changes that potentially could occur in infrastructure development over the next 15 to 20 years. The anticipated costs for Alternatives A, B, and C are shown below. They are presented separately for mainland gateways, on-island infrastructure, and for a special initiative to be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island.

In general, the National Park Service Class "C" cost estimating guide was used. A 20% adjustment was added to the estimates in the Class "C" guide for the cost of doing business on Boston Harbor. Some costs are based on relevant local experience. For instance, the Metropolitan District Commission (MDC) dock at Peddock's Island, which was completed in 1999, was the basis for ferry pier estimates. The cost estimates for each alternative show gross construction costs; pre-design and supplemental services; and design costs in year 2000 dollars. Pre-design costs and services include site-specific studies and assessments that must be completed before design of the project can move forward (e.g. archeological investigations, historic resource studies, natural resource surveys).

MAINLAND GATEWAYS

The draft general management plan identifies several locations for potential mainland gateways. The following costs were calculated for the Partnership members' role in developing a typical gateway.

- entrance and orientation sign
- site furnishings
- shade shelter
- retail space
- highway sign package
- visitor contact station/kiosk
- wayside exhibits

All other infrastructure costs (piers, parking, food service, restrooms, utilities, etc.) would be provided by cooperators, not the Partnership. Development of infrastructure at gateways depends on visitor demand and on cooperators. The estimated Partnership cost for a typical gateway endorsed as an official departure point for the islands is \$1.2 million.

	Gross Construction	Predesign & Supplemental Services	Design	ANTICIPATED COSTS
visitor kiosk	87,910	5,215	7,450	100,575
concession/retail/tickets	828,360	49,140	70,200	947,700
site furnishings	11,800	700	1,000	13,500
shade shelter	17,700	1,050	1,500	20,250
highway signs	84,960	5,040	7,200	97,200
entrance sign	23,600	1,400	2,000	27,000
informational signs	2,360	140	200	2,700
interpretive waysides	25,488	1,512	2,160	29,160
TOTAL MAINLAND GATEWAY	1,082,178	64,197	91,710	1,238,085

ISLAND INFRASTRUCTURE

In order to maintain consistent treatment of the islands when identifying anticipated costs, it was assumed that all infrastructure and facilities "allowed" within each geographic management area would be developed on each island. While this will not happen, the assumption provides a rational approach to cost estimation for a general plan that does not specify site development. No capital costs were calculated in the Special Use management area. The island location for an Indian cultural center is not known, so a generic cost estimate is included in each alternative.

ALTERNATIVE A

It is estimated that upwards of \$61 million would be needed to implement Alternative A on the islands, and gateway development could range from \$4 million to \$20 million, depending on how many mainland locations were developed over time. A special initiative to be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island could cost upwards to \$16 million.

ALTERNATIVE A	Gross Construction	Predesign & Supplemental Services	Design	ANTICIPATED COSTS
education centers & visitor kiosks (new construction)	1,579,548	93,702	133,860	1,807,110
treatment of historic structures (including adaptive reuse)	18,855,227	1,118,530	1,597,901	21,571,658
treatment of archeological sites (stabilization)	1,534,000	91,000	130,000	1,755,000
retail, ticket booths, etc. (new construction)	207,090	12,285	17,550	236,925
staff & maintenance facilities (new construction)	344,560	20,440	29,200	394,200
restrooms & composting toilets	752,486	44,639	63,770	860,895
shade shelters	70,800	4,200	6,000	81,000
floating ecological camp units	297,360	17,640	25,200	340,200
utilities	3,781,900	224,350	320,500	4,326,750
landscaping & site work	3,753,978	222,694	318,134	4,294,806
site furnishings	153,400	9,100	13,000	175,500
treatment of historic landscapes	1,770,000	105,000	150,000	2,025,000
trails	1,382,488	82,012	117,160	1,581,660
beach rehabilitation	236,000	14,000	20,000	270,000
wetlands & native plants revegetation	2,231,552	132,380	189,115	2,553,047
outdoor amphitheaters	-	-	-	-
campsites & showers	148,443	8,806	12,580	169,829
piers & floats	9,475,400	562,100	803,000	10,840,500
moorings	-	-	-	-
marina slips	-	-	-	-
marine-related handicapped improvements	1,274,400	75,600	108,000	1,458,000
signs & wayside exhibits	717,440	42,560	60,800	820,800
exhibits	1,180,000	70,000	100,000	1,350,000
environmental cleanup (USTs & asbestos)	3,305,180	196,070	280,100	3,781,350
TOTAL INFRASTRUCTURE : A	53,051,252	3,147,108	4,495,869	60,694,229

PEDDOCK'S ISLAND: ALTERNATIVE A	Gross Construction	Predesign & Supplemental Services	Design	ANTICIPATED COSTS
treatment of historic structures (including adaptive reuse)	4,993,524	296,226	423,180	5,712,930
building removal	1,878,560	111,440	159,200	2,149,200
restrooms & composting toilets	113,280	6,720	9,600	129,600
shade shelters	17,700	1,050	1,500	20,250
utilities	1,554,650	92,225	131,750	1,778,625
landscaping & site work	1,675,541	99,397	141,995	1,916,933
site furnishings	23,600	1,400	2,000	27,000
treatment of historic landscapes	708,000	42,000	60,000	810,000
trails	1,086,638	64,462	92,088	1,243,188
beach rehabilitation	-	-	-	-
wetlands & native plant revegetation	1,225,666	72,709	103,870	1,402,245
outdoor amphitheaters	-	-	-	-
campsites & showers	260,426	15,449	22,070	297,945
moorings	118,000	7,000	10,000	135,000
signs & wayside exhibits	81,656	4,844	6,920	93,420
exhibits	590,000	35,000	50,000	675,000
PEDDOCK'S INFRASTRUCTURE: A	14,327,241	849,921	1,214,173	16,391,336

ALTERNATIVE B

It is estimated that upwards of \$88 million would be needed to implement Alternative B on the islands, and gateway development could range from \$4 million to \$20 million, depending on how many mainland locations are developed over time. A special initiative to be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island could cost upwards to \$57 million.

ALTERNATIVE B	Gross Construction	Predesign & Supplemental Services	Design	ANTICIPATED COSTS
education centers & visitor kiosks (new construction)	5,923,541	351,397	501,995	6,776,933
treatment of historic structures (including adaptive reuse)	19,130,757	1,134,875	1,621,251	21,886,883
treatment of archeological sites (stabilization)	1,534,000	91,000	130,000	1,755,000
retail, ticket booths, etc. (new construction)	5,591,430	331,695	473,850	6,396,975
staff & maintenance facilities (new construction)	2,691,580	159,670	228,100	3,079,350
restrooms & composting toilets	780,806	46,319	66,170	893,295
shade shelters	106,200	6,300	9,000	121,500
floating ecological camp units	297,360	17,640	25,200	340,200
utilities	1,602,440	95,060	135,800	1,833,300
landscaping & site work	6,650,834	394,541	563,630	7,609,005
site furnishings	224,200	13,300	19,000	256,500
treatment of historic landscapes	1,770,000	105,000	150,000	2,025,000
trails	2,390,680	141,820	202,600	2,735,100
beach rehabilitation	472,000	28,000	40,000	540,000
wetlands & native plants revegetation	2,660,535	157,828	225,469	3,043,833
outdoor amphitheaters	669,131	39,694	56,706	765,531
campsites & showers	223,068	13,233	18,904	255,205
piers & floats	14,785,400	877,100	1,253,000	16,915,500
marina slips	708,000	42,000	60,000	810,000
marine-related handicapped improvements	2,218,400	131,600	188,000	2,538,000
moorings	47,200	2,800	4,000	54,000
fishing pier	590,000	35,000	50,000	675,000
signs & waysides	885,826	52,549	75,070	1,013,445
exhibits	1,622,500	96,250	137,500	1,856,250
environmental cleanup (USTs & asbestos)	3,305,180	196,070	280,100	3,781,350
TOTAL INFRASTRUCTURE: B	70,957,528	4,209,345	6,013,350	87,957,155

PEDDOCK'S ISLAND: ALTERNATIVE B	Gross Construction	Predesign & Supplemental Services	Design	ANTICIPATED COSTS
treatment of historic structures (including adaptive reuse)	31,321,442	1,858,052	2,654,360	35,833,853
building removal	1,878,560	111,440	159,200	2,149,200
restrooms & composting toilets	349,280	20,720	29,600	399,600
shade shelters	35,400	2,100	3,000	40,500
utilities	3,000,463	177,994	254,277	3,432,733
landscaping & site work	8,319,471	493,528	705,040	9,518,038
site furnishings	23,600	1,400	2,000	27,000
treatment of historic landscapes	708,000	42,000	60,000	810,000
trails	1,086,638	64,462	92,088	1,243,188
beach rehabilitation	236,000	14,000	20,000	270,000
wetlands & native plant revegetation	1,225,666	72,709	103,870	1,402,245
outdoor amphitheaters	154,415	9,160	13,086	176,661
campsites & showers	272,226	16,149	23,070	311,445
moorings	118,000	7,000	10,000	135,000
signs & wayside exhibits	81,656	4,844	6,920	93,420
exhibits	590,000	35,000	50,000	675,000
PEDDOCK'S INFRASTRUCTURE: B	49,400,817	2,930,557	4,186,510	56,517,883

ALTERNATIVE C

It is estimated that upwards of \$79 million would be needed to implement Alternative C on the islands, and gateway development could range from \$4 million to \$20 million, depending on how many mainland locations are developed over time. A special initiative to be conducted in collaboration with the private sector for developing infrastructure at Fort Andrews on Peddock's Island could cost upwards to \$56 million.

ALTERNATIVE C	Gross Construction	Predesign & Supplemental Services	Design	ANTICIPATED COSTS
education centers & visitor kiosks (new construction)	4,240,448	251,552	359,360	4,851,360
treatment of historic structures (including adaptive reuse)	18,501,227	1,097,530	1,567,901	21,166,658
treatment of archeological sites (stabilization)	1,534,000	91,000	130,000	1,755,000
retail, ticket booths, etc. (new construction)	2,692,170	159,705	228,150	3,080,025
staff & maintenance facilities (new construction)	1,694,480	100,520	143,600	1,938,600
restrooms & composting toilets	516,486	30,639	43,770	590,895
shade shelters	123,900	7,350	10,500	141,750
floating ecological camp units	297,360	17,640	25,200	340,200
utilities	4,794,340	284,410	406,300	5,485,050
landscaping & site work	5,239,303	310,806	444,009	5,994,118
site furnishings	212,400	12,600	18,000	243,000
treatment of historic landscapes	1,770,000	105,000	150,000	2,025,000
trails	1,559,488	92,512	132,160	1,784,160
beach rehabilitation	472,000	28,000	40,000	540,000
wetlands & native plant revegetation	2,488,942	147,649	210,927	2,847,519
outdoor amphitheaters	514,716	30,534	43,620	588,870
campsites & showers	183,843	10,906	15,580	210,329
piers & floats	13,605,400	807,100	1,153,000	15,565,500
moorings	47,200	2,800	4,000	54,000
marina slips	708,000	42,000	60,000	810,000
marine-related handicapped improvements	2,218,400	131,600	188,000	2,538,000
signs & wayside exhibits	854,320	50,680	72,400	977,400
exhibits	1,622,500	96,250	137,500	1,856,250
environmental cleanup (USTs & asbestos)	3,305,180	196,070	280,100	3,781,350
TOTAL INFRASTRUCTURE: C	69,196,103	4,104,854	5,864,077	79,165,033

PEDDOCK'S ISLAND: ALTERNATIVE C	Gross Construction	Predesign & Supplemental Services	Design	ANTICIPATED COSTS
treatment of historic structures (including adaptive reuse)	31,321,442	1,858,052	2,654,360	35,833,853
building removal	1,878,560	111,440	159,200	2,149,200
restrooms & composting toilets	113,280	6,720	9,600	129,600
shade shelters	35,400	2,100	3,000	40,500
utilities	3,000,463	177,994	254,277	3,432,733
landscaping & site work	8,260,471	490,028	700,040	9,450,538
site furnishings	23,600	1,400	2,000	27,000
treatment of historic landscapes	708,000	42,000	60,000	810,000
trails	1,086,638	64,462	92,088	1,243,188
beach rehabilitation	236,000	14,000	20,000	270,000
wetlands & native plant revegetation	1,225,666	72,709	103,870	1,402,245
outdoor amphitheaters	154,415	9,160	13,086	176,661
campsites & showers	272,226	16,149	23,070	311,445
moorings	118,000	7,000	10,000	135,000
signs & wayside exhibits	81,656	4,844	6,920	93,420
exhibits	590,000	35,000	50,000	675,000
PEDDOCK'S INFRASTRUCTURE: C	49,105,817	2,913,057	4,161,510	56,180,383

APPENDIX 6: IMPLEMENTATION PHASING

The draft management general plan has a 20-year planning horizon and presents a framework for park management. The planning horizon for the first phase of implementation is five years. This coincides with the time frame of the park strategic plan. The specifics of how the general plan will be accomplished will be contained in the park strategic plan (and accompanying annual performance plans) and in implementation plans. The strategic management plan is a tool to ensure that actions are guided by goal-setting and followed by performance measurement and evaluation.

The following initiatives would be carried out during Phase I (the first 5 years) of the proposal. The remainder of the actions needed to implement the general management plan would take place during Phase II (year 6 and beyond). Each initiative includes several long-term goals that help define the desired outcome. The long-term goals address the park mission and mission goals presented in the draft general management plan.

NOTE: Phase I implementation, with associated costs, will be inserted in the appendix once an alternative is selected and a proposal presented in the final general management plan.

APPENDIX 7: SUMMARY OF CULTURAL LANDSCAPE STUDY

The Olmsted Center for Landscape Preservation of the National Park Service conducted an overview of the cultural landscapes of the Boston Harbor Islands. A report of this study will be published in 2000 separately from the general management plan. The following summarizes the study's findings.

Although most were never permanently settled, nearly all of the Boston Harbor Islands contain significant cultural resources related to coastal defense, agriculture, commercial fishing, year-round and summer habitation, resort life, industry, public health, and social welfare. Textual documentation exists for Euro-American agricultural use of the islands from as early as 1634; archeological and anecdotal evidence indicate the existence of a pre-contact corn culture among the indigenous peoples on many of the islands. During the 17th, 18th, and early 19th centuries, the islands of the Inner Harbor, as well as those of Quincy and Hingham bays, served as pasturage for mainland cattle and sheep. Bumpkin, Rainsford, and Long islands contain some of the sites in the metropolitan area that suggest the Commonwealth's fleeting "plantation period." The agricultural tradition on the islands came to an end in the 1930s, when both the Thompson Academy on Thompson Island and the Brewer estate at World's End curtailed farming activities. Extant evidence of agricultural use on the islands is limited to scattered fruit trees, fragments and foundations of residential buildings and farm structures, wells, stone walls and dams, and shrub and herbaceous vegetation in formerly cleared areas. The foundation of the David Thompson's house, perhaps the first English building in Boston Harbor, was discovered on Thompson Island in 1889 and provides evidence of early agricultural activities, as well as trade links with Native American populations.

The islands' natural resources attracted a number of cultural communities, whose resource-based use and activities have left their imprint on the landscape. From prehistoric times, the Harbor Islands were important fishing and hunting outposts. Shell middens and other recovered faunal remains indicate multi-site seasonal settlement patterns on many of the islands, beginning as early as the Middle Archaic period. Occupation of the Harbor Islands seems to have intensified during the Woodland periods, and though contact with Europeans disrupted aboriginal lifeways, Native Americans continued seasonal occupation of the islands during the contact period, following available natural resources. Euro-Americans also used many of the islands as a base for harvesting marine resources. Archeological evidence locates 19th-century fishing settlements on Green, Calf, and Bumpkin islands. Residential communities established

by Portuguese fishermen on Long, Rainsford, and Peddock's islands demand further investigation. In addition, the deforested landscapes and other environmental depredations on many of the islands bear witness to the legacy of Euro-American resource extraction, including timber harvesting throughout the harbor area and quarrying on Slate and Outer Brewster islands.

By far the most abundant evidence of human use of the islands relates to coastal protection and defense. As an early center of maritime commerce, Boston required protection from sea-borne foes. Beginning with Fort Independence on Castle Island, now an MDC property listed on the National Register of Historic Places and believed to be the oldest continuously occupied fortification in British North America, Boston Harbor boasted an important system of coastal defenses that at its peak included seven active forts. The partially restored Fort Warren, an impressive granite Third System fortification designated as a National Historic Landmark, has stood on George's Island as a major defensive post for the protection of the harbor in every conflict from the Civil War through World War II. Fort Andrews, erected on Peddock's Island in the first decade of this century, is a rare example of a relatively intact coastal fort of the Endicott Period (1888–1905); its 26 remaining buildings and structures, many constructed with red brick walls and slate roofs in a simple Colonial Revival style, are situated along a drumlin ridge that once commanded an expansive view of Boston Harbor. Artillery batteries, constructed during successive reinforcement campaigns throughout the nation's history, remain in varying states of obscurity and disrepair on many of the islands as evidence of a continuously evolving, integrated system of coastal defense. Sea walls constructed by the Army Corps of Engineers on many of the fortified islands, together with the Civil War cemetery on Long Island and several purported, yet unmarked burial sites, suggest military presence in the cultural landscapes of the Harbor Islands.

The importance of shipping to the Boston economy led to increased concern for harbor safety. Navigational aids constructed to guide ships through the often treacherous harbor channels and roads include Boston Light on Little Brewster Island, a National Historic Landmark which is purported to include portions of the oldest lighthouse structure in the United States; lighthouses on Long Island and The Graves; and the channel marker on Nix's Mate. There are no known remains of the huts of refuge constructed by the Massachusetts Humane Society to shelter shipwreck victims on the islands during the 19th century, although the Hull Lifesaving Museum preserves important artifacts

from the lifesaving activities of volunteer organizations of the harbor's coastal towns.

The most intensive human use of the islands has been to house facilities that have addressed serious issues of urban life. The influence of antebellum reform thought, which favored isolation as the solution for social and public health problems, made the islands a tempting location for facilities and institutions deemed unsightly and often read as evidence of threats to the social order. The earliest documented use of the islands as repositories for such problems was the internment of Christian Indians on Deer Island during King Philip's War, a conflict for which there is ample textual documentation, but no known physical evidence of camps or burials. War prisoners were confined at Fort Warren on George's Island during the Civil War and at Fort Andrews on Peddock's Island during World War II. Similar institutions, basically penal but ostensibly oriented toward reforming their inmates, existed on other islands. Rainsford Island contains the ruins of many 19th-century institutions, including a home for delinquent boys that operated there until the 1920s. The relocation of the Suffolk County House of Corrections in 1991 ended Deer Island's history as one of the oldest penal sites in continuous use in the United States and obscured the functional landscapes that demonstrated the institution's punitive and reformatory mission.

Victims of infectious disease, mental illness, and poverty were also thought to be pernicious social problems that could undermine the social order and were more easily managed in the isolated setting of the harbor islands. Among the ruins on Rainsford Island may be fragments of a neo-Classical building that served as a quarantine hospital during the early 19th century, as well as the unmarked graves of hundreds of victims of smallpox and other infectious diseases. A late-19th-century municipal almshouse, converted to both a home for unwed mothers and homeless men and a treatment center for substance abuse and mental illness during this century, served as a precursor to the Long Island Chronic Care Hospital. Though the City of Boston no longer offers medical services at the site, a range of social services agencies operating at the Long Island campus preserves evidence of the island's complex institutional past. The remains of an early-20th-century immigration station established by the U.S. Public Health Service on Gallop's Island serve as yet another reminder of the role the islands played in the history of Boston's burgeoning population. On Bumpkin Island, the foundations of the Burrage Hospital, a summer facility for paraplegic children that temporarily housed a naval installation during World War I, bears testimony to an incipient shift in the public perception of both the management of social concerns and the restorative potential on harbor

island landscapes. This trend is best illustrated on Thompson Island, where an asylum for indigent boys in the 1830s gave way to an agricultural and vocational school later in the century before its evolution into the Thompson Island Outward Bound Education Center.

Positioned for recreational use by their proximity to a large urban population, the harbor islands intermittently have been a popular pleasure ground for Bostonians of all classes. Many islands were used for picnics, fishing, and bathing, as well as for illegal gambling and boxing matches during the summer months. Little remains of the summer hotels that once operated on Spectacle, Gallops, Peddock's, and Rainsford islands, but fragments of summer residences at World's End and on Calf, Long, and Middle Brewster islands bear witness to the once vibrant landscapes of these summer communities. Summer cottages on Peddock's Island are the last remaining residential structures on the Harbor Islands and allude to the former prevalence of summer communities and recreational activities in the harbor. While the islands were not viewed historically as a collective recreational asset, Frederick Law Olmsted's vision for the reforestation of the islands and protection of the harbor's green spaces was partly realized with the creation of the Boston Harbor Islands State Park nearly a century later in 1970.

Deer Island continues to serve in the islands' traditional roles as a repositories for municipal waste. Alongside the much-expanded and modernized MWRA wastewater treatment facility stands the pump house of a sewage station erected in 1889, recalling early attempts to deal concertedly and scientifically with the solid and liquid wastes that have been carried to Boston Harbor since 1878. The granite containers of a "state-of-the-art" sewage treatment plant built in 1873 remain on Moon Island, as does an outmoded sewage treatment plant constructed at the turn of the century on Nut Island.

In these respects, the Boston Harbor Islands collectively represent an unbroken historical thread in the story of maritime and urban development. The islands' cultural landscapes not only demonstrate patterns of land use that prevailed during different periods of the city's history, but document shifts in cultural values and in the fabric of collective identity, one often rent with discord but mended with informed and vigilant care.

APPENDIX 8: SUMMARY OF WATER TRANSPORTATION STUDY

National Park Service policy is to provide a variety of well-integrated transportation options in parks and to encourage public transportation wherever feasible. In general, transportation systems in units of the national park system will:

- provide for visitor use and enjoyment
- enhance the visitor experience by
 - offering new or improved interpretive opportunities
 - simplifying travel within the park, or
 - making it easier to see park features
- provide accessibility for disabled persons
- reduce traffic congestion, noise, air pollution, and adverse effects on park resources and values
- conserve energy
- consider cost

The Volpe National Transportation Systems Center (part of the U.S. Department of Transportation), and TAMS Consulting were hired to support the water transportation planning in collaboration with the Partnership and surrounding municipalities. The aim is to provide long-range guidance on service, vessel, and gateway requirements that will maximize the visitor experience, be environmentally responsible, and be economically viable for boat operators; and to recommend a system of water transportation services in the short term (2000–2005). A short-term water transportation plan was developed through a collaborative process of island owners and municipalities with input from local boat operators.

SUMMARY OF GUIDELINES FOR TRANSPORTATION

These guidelines are based on the following assumptions. First, ferry service will expand in phases over time. Visitor demand is expected to grow, with an increase in recreational opportunities, cultural and historical programs, and their attendant capital improvements and publicity. Ferry service will need to expand with that growth.

Ferry service will build on existing ferry networks. The primary service will continue to be direct access to the island hubs. It may be supplemented by spine routes that primarily provide commuter service; these can provide additional service as visitation increases. As additional islands are opened for visitors, additional direct access service may be necessary. Inter-island service will continue to be provided by a water shuttle.

Additional gateways and routes will be added when there is demonstrated demand. The park would be expected to authorize routes that are economically

sustainable overall. When visitor demand warrants, new ferry departure points and routes would be added.

Three possible options for managing the water transportation system have been identified. The options are: (1) a contract with a single provider who has exclusive landing rights; (2) route franchises; and (3) open competition among all boat operators for ferry and water shuttle business with an associated docking fee management program. Route franchises are contracts with a boat operator to depart from specific mainland gateways with specific stop(s) at one or more island hubs in exchange for exclusive rights to that particular route. The route franchise concept provides predictability of schedule and fares while increasing flexibility of service options.

Route franchise operators may be required to financially support the water shuttle routes. Water shuttle services are not economically viable on their own and thus may need to be subsidized by ferry operators through head fees on gateway services.

Docking rights will be limited by franchise conditions. Commercial operators other than the franchise holder may have limited access to particular docks.

Island docks, which are controlled by park managers, will not be open to commercial ferries without regulation. Visitors expect certain levels of service from park managers. Ferry service needs to be coordinated with the park so that sufficient staff will be on islands to provide visitor services and protect resources.

Ferry services will be financially self-sustaining. To the maximum degree possible, the ferry service will need to operate without federal, state, or local government subsidies.

Some state funding is available through the transportation bond bill and other sources for capital improvements (e.g., infrastructure or vessels) and demonstration projects, but not for ongoing operations subsidies.

Lastly, demonstration projects will be used to test routes, ferries, and ridership demand. Pilot projects can test the feasibility of routes and ridership demand as well as the feasibility of new types of ferries.

The recommended management option for the short-term Boston Harbor Islands ferry system (2000–2005) is for multiple operators to provide services for the proposed schedules for peak and shoulder season service, including (1) “gateway” services from various mainland locations to the islands, (2) a separate inter-island shuttle system, and (3) accommodation of independent charter operations. Gateway as well as island terminal facility management is required. Three sets of

mainland-to-island gateway services are recommended:

(1) Central routes from downtown hub terminals to George's Island, (2) central routes to Spectacle Island, (3) additional services from South Shore and North Shore gateways may be proposed by operators. There will be no operating subsidies for these routes. All operators will need to conform to schedule, fare price, and operations requirements. A separate shuttle operation is included with two loops, north and south. Funding for the shuttles may come from head fees on gateway services and charter operations as well as corporate grants. As with current service, there will be no fare charge on the shuttle. Charter operations will be open to multiple qualifying operators.

APPENDIX 9:

VISITOR EXPERIENCE AND RESOURCE PROTECTION (CARRYING CAPACITY)

THE PROCESS

One of the requirements of a general management plan is the identification of and implementation of commitments for carrying capacity. To comply with this mandate, a process known as visitor experience and resource protection has been developed within the National Park Service. This process interprets carrying capacity not as a prescription of numbers of people but as a prescription of desired ecological and social conditions. Measures of the appropriate conditions replace the measurement of maximum sustainable use. Based on these conditions, the process identifies and documents the kinds and levels of use that are appropriate as well as where and when such uses should occur. The prescriptions, coupled with a monitoring program, are intended to give park managers the information and the rationale needed to make sound decisions about visitor use and to gain the public and agency support needed to implement those decisions.

A major premise of the visitor experience and resource protection process is that the characteristics of a management area, which are qualitative in nature, must be translated into something measurable to provide a basis for making wise decisions about appropriate visitor use. Since management actions are normally more defensible when they are based on scientific data, the process incorporates the concept of "limits of acceptable change" as part of the decision-making process. Desired resource or social conditions are expressed as explicit, measurable indicators, and standards (i.e., minimum acceptable conditions) are selected to determine whether the conditions are met or exceeded. Resource indicators are used to measure impacts on the biological or physical resources, while social indicators are used to measure impacts on park users that are caused by interactions with other users and park employees.

The first critical steps of the applying the visitor-experience-and-resource-protection process to the Boston Harbor Islands will be accomplished as part of the general management plan. These steps are :

1. Develop a mission statement which incorporates the park's purpose and significance.
2. Analyze park resources and existing visitor use.
3. Describe the range of resource conditions and visitor experiences for the park as distinct management areas.
4. Apply the management areas to specific locations of the park.

Subsequent to the general management plan, the following steps will be taken to complete the process:

5. Select quality indicators and specifying associated standards for each management area. The purpose of this step is to identify measurable physical, social, or ecological variables that will indicate whether or not a desired condition is being met. Monitoring techniques for each management area are also selected and evaluated in this step.
6. Compare desired conditions to existing conditions. Each management area will be monitored to determine if there are discrepancies with the desired resource and social conditions.
7. Identify the probable causes of discrepancies in each management area.
8. Identify management strategies to address discrepancies. Visitor use management prescriptions will start with the least restrictive measures that will accomplish the objective and move toward more restrictive measures if needed.
9. Carry out long-term monitoring. Monitoring provides periodic, systematic feedback to park managers to ensure that desired resource and visitor experience conditions continue to be achieved over the long term.

Once the indicators and standards are established, park managers can develop a monitoring plan to determine priorities and identify methods, staffing, and analysis requirements. The results of the monitoring analysis will enable park managers to determine whether a park's resources are being adequately protected and desired visitor experiences are being provided, and to take management actions necessary to achieve the goals of the Boston Harbor Islands.

EXAMPLES OF INDICATORS AND STANDARDS

The Boston Harbor Islands national park area will begin an intensive inventory and monitoring program. It will include collecting existing and widely scattered data and instituting a parkwide process of scientific data gathering and evaluation that will further the application of monitoring for resource conditions and public experience within the park.

The following examples come from Arches National Park in Moab, Utah. The Boston Harbor Islands Partnership would develop its own resource indicators and standards. The selection of appropriate standards for the resource indicators in each management area will be based on the relative tolerance for resource impacts and

the judgment of park planners and resource managers about the minimum conditions needed to maintain the desired experience.

RESOURCE CONDITIONS

Indicator: the percentage of the soil surface at a campsite with bare ground

Standard: 60% of the soil surface at a campsite is bare ground

Indicator: the degree of soil compaction measured 5 feet from a trail centerline

Standard: 80% of the soil surface samples exhibit 50% of the porosity of a relatively undisturbed area

Indicator: the average soil crust index value for a 100-meter transect

Standard: the average soil crust index for a transect is 4

Indicator: the number of exposed tree roots exceeding 2 inches in diameter, measured within 6 feet of a trail edge for a hundred feet of trail

Standard: 20% of tree roots are exposed relative to a control area

SOCIAL CONDITIONS

Indicator: the percentage of parties that can camp out of the sight or sound of other parties in the backcountry

Standard: 70% of parties report that they could camp out of the sight and sound of other parties

Indicator: number of people seen at one time at Grand Arch over the course of a year

Standard: 90% of visitors over the course of a year see more no more than 30 people at one time

Indicator: the number of people encountered along a trail per day over the course of a year

Standard: 80% of visitors over the course of a year encounter no more than 10 people per day along the trail

Indicator: the traffic congestion during peak visitor use days

Standard: roadways do not exceed level D service for more than 10% of peak use days

Indicator: the waiting period required to see an attraction during peak use days

Standard: no more than 10% of visitors wait 10 or more minutes to see the attraction

APPENDIX 10: FUTURE PLANS AND STUDIES

The Boston Harbor Islands national park area needs extensive baseline data on the entire island system. Following is a list of plans and studies that will be undertaken. Costs for each plan or study will depend on the scope of the project, which in turn will be affected by available funding at the time the project is initiated.

NATURAL RESOURCE BASELINE

- Natural Resource Inventory
- Monitoring Vital Signs

VISITOR USE

- Management Area Carrying Capacity (VERP)
- Visitor Profiles

CULTURAL RESOURCE BASELINE

- Archeology Overview and Assessment
- Cultural Landscape Report
- Ethnographic Overview and Assessment
- Historic Resource Study
- Historic Structures Reports and Preservation Guides
- Land Use Study
- List of Classified Structures
- Park History
- Scope of Collections

STRATEGIC PLANS

- Five-year Strategic Plans
- Annual Performance Plans

IMPLEMENTATION PLANS

- Archeological Resources Management Plan
- Collections Management Plan
- Commercial Service Plan
- Comprehensive Identity and Signage Plan
- Comprehensive Interpretive Plan
- Economic Plan
- Fire Management Plan
- Hazardous Materials Survey
- Integrated Pest Management Plan
- Invasive Plants Management Plan
- Land and Water Transportation Plan
- Land Protection Plan
- Public Safety Plan
- Resource Management Plan
- Shoreline and Seawall Management Plan
- Trail Management Plan
- Vegetation Restoration Plan
- Visitor Use Management Plan
- Visitor Carrying Capacity Guideline (VERP)
- Wetland and Floodplain Protection Plan

APPENDIX 11: SPECTACLE ISLAND DEVELOPMENT

Spectacle Island, one of the largest and closest-in harbor islands, has a history of receiving society's detritus. At the approach of the 21st century, it is again a recipient of material from elsewhere, but this time it is undergoing renewal and development as a park built up into two new hills, like drumlins, with fill from Boston's highway and tunnel construction project. When completed, these hills will be the highest points in the harbor with 360-degree vistas.

The island managers, the City of Boston and the Massachusetts Department of Environmental Management, have worked with the Massachusetts Turnpike Authority's central artery and tunnel project and the Spectacle Island Park Advisory Committee to develop a plan for the island. They have also developed a partnership with the New England Aquarium, the construction company Modern Continental, and the University of Massachusetts Urban Harbors Institute to manage and develop programs for the island's operations once park development is complete.

The plan calls for one building structure of approximately 7,500 square feet to house a visitor information facility, a café, exhibits, a classroom, a souvenir shop, staff living areas, staff workspace, a first aid area, and a variety of maintenance, storage, and janitorial space.

The New England Aquarium will maintain exhibits, assist with visitor information and orientation, run school and youth programs, and have films and lectures. Throughout the island there will be land-and water-based recreational opportunities. These may include hiking, cross-country skiing, sea kayaking, scuba diving,

birdwatching, picnicking, concerts, interpreted nature trails, and outdoor research-based exhibits such as experimental nature restoration projects.

The University of Massachusetts Urban Harbors Institute will provide expertise for research on sustainable usage, coastal zone management, marine transportation, and water quality analysis. Modern Continental Companies, Inc. will handle marina management and any future construction activities, as appropriate to expanding visitor needs.

The U.S. Department of Transportation has awarded a \$500,000 grant to "make Spectacle Island a futuristic land of zero-emission power. It will be powered by solar energy collectors and offer visitors rides in electric cars and on an electric boat and electric bicycles, becoming a kind of demo for a post-fossil-fuel world, and a model for other national parks," to quote from *The New York Times*, June 29, 1999.

The park landscape will include five miles of pathways, two sandy beaches, artwork, and a variety of flora for erosion control and scenery. A pier and marina will be part of the development for both ferry vessels and private watercraft.

A goal of the programming and operations is to sustain the island by revenue-generating activities such as food service, marina services, docking fees, pier development, group sales, souvenir shop, tours, conferences, and special events. Integral is the idea of accomplishing the goals through the use of "green" technology wherever feasible. The island is expected to be open to the public in 2002.

APPENDIX 12: PEDDOCK'S ISLAND DEVELOPMENT

A Summary of *Peddock's Island Reuse Feasibility Study* by the New England Chapter of the Counselors of Real Estate, May 1999

On behalf of the Metropolitan District Commission (MDC) and the Island Alliance (IA), a group of highly experienced and knowledgeable real estate consultants undertook a year-long pro-bono investigation into the feasibility of developing Fort Andrews on Peddock's Island. The purpose was to determine basic feasibility of a range of uses and to provide a framework for evaluating future concepts of reuse for the 100-year old fort, while keeping other parts of the island undeveloped. The group explored the current conditions of the fort, examined previous proposals for its reuse, evaluated the potential market for new uses, and reviewed legal issues related to allowing private operations within public property.

Adaptive reuse of Fort Andrews could optimize the history, architecture, and layout of the fort, potentially creating a recreational village or conference center with ancillary facilities around an educational theme. It could provide an unusual setting close to the large metropolitan area of Boston in which to draw visitors for a range of island-related activities, including fishing, sailing, boating, sea kayaking, and hiking.

The Counselors concluded that Peddock's Island has potential for becoming a centerpiece of the Boston Harbor Islands national park area for year round use, but especially for three seasons of very active use. Possible uses for Fort Andrews might be for a conference center, bed and breakfast inns, a restaurant, an environmental education center, laboratories, research facility for an institution like the New England Aquarium, an American Indian center, a college facility for parks education, camping, a marina, or a children's camp for environmental education.

The Counselors reached several conclusions. Development of Fort Andrews could not be accomplished at once but would need to be phased over ten years or more, the group believes. Private sector operations for camping, marina, and concessions would be necessary to gain revenues for maintaining the island. However, a large investment in infrastructure by public agencies would be needed in order to be attractive to the private sector. Authority to issue long-term leases would also be essential for private-sector investors, and would need specific legislative authority, for which there are several recent examples in the state. Costs were itemized for the first phase (see Implementation Costs in Appendix 5). Revenues sources would be from fees for lodging,

conferences, moorings, campsites, equipment rentals. The phases recommended are:

- the "beachhead," in first three years; concept plan refined, visitor facility developed, site cleanup and clearing around buildings, water and sanitary systems installed, rehabilitation of several historic structures, development of campsites, playfields, and moorings.
- the "expansion," years four through seven with rehabilitation of remaining buildings, full infrastructure expanded, "opportunity sites" readied for final development, marketing activities accelerated.
- the "realization" in years eight through ten with sites leased and developed and ten-year program completed.

APPENDIX 13: HARBOR VISIONS YOUTH CHARRETTE

The drawings in this appendix come from the *1998 Harbor Visions Newsletter*, a product of a youth corps called Harbor Visions Crew, which is jointly sponsored by the Massachusetts Water Resources Authority, Save the Harbor/Save the Bay, and Roxbury Multi-Service Center. The Harbor Visions Crew was created in 1994 and has participated in a variety of public information projects related to Boston Harbor and the Boston Harbor Islands including a "charrette" (a brainstorming session to produce designs and concepts for a place). At the 1998 charrette Harbor Visions Crew and invited guests focused on the future potential of the harbor and islands. Other projects have included water conservation, pollution, access to the harbor islands, environmental law, and environmental preservation.

Visions From the Youth Charrette

1998

Access / Publicity

Through both surveys and discussions during the Charrette, the Crew learned that the youth of Boston want to...

- Have piers around the Harbor and shuttles to them, i.e. to Quincy Bay, Savin Hill, JFK/UMASS
- Establish a wet line of buses, boats and trains. Transportation that picks people up from a stop and takes them to a stop along the harbor where they can connect to the water ferries and/or taxis.
- Promote the islands through T.V. and newspaper ads.
- Give specials every once in a while. i.e. sales, discounts, special holiday bonuses, group discounts.
- Have coupons for boat rides (1/2 off or \$1 off)
- Complete the Harbor Walk that goes from Roxbury to the North End.
- Create/complete a bike path from the inner city to and along the Harbor.

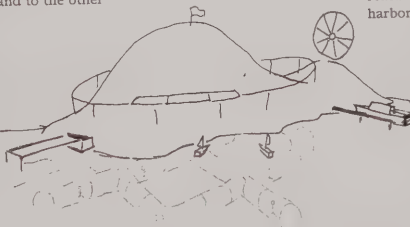


Recreation

Spectacle Island. What do people want to see, how would they like to enjoy their new park, what would they like to do with it? Here are some of the ideas that the young people of the Youth Charrette came up with.

Monorail system: A cool transportation system that would encompass the island and move families to and from one side of the island to the other

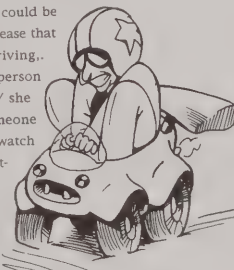
Jutting piers: Would allow small businesses and boaters to dock and have a good time.



See through Garage/ Tunnel: Would allow people to have contact with what's underneath the Harbor's waters..

Giant Ferris Wheel on Spectacle Island Pier: Most adults have an inner child in which needs to be dealt with in some way. A ferris wheel is a good solution. One, because both parents and their children could ride and because most, if not all people like to ride ferris wheels. Two; once the wheel reaches it's peak, people are able to see out over the entire harbor, the islands and the Boston Skyline.

Go-Kart Track: Many people love to drive no matter what age they are. A go-kart track could be opened to appease that hunger for driving.. So when one person goes, then he/ she will bring someone else along to watch them, thus getting the word out on the street about the island.



Visions From the Youth Charrette



Restaurants:

Imagine eating on beautiful Spectacle or Long island and enjoying the sunset. The food is great. You're there with your family or loved one(s). The best thing about it is that the bill isn't going to rip a hole in your wallet (unless, of course, you order that blue lobster, clam and calamari dinner you've been salivating for). That would be quite nice, wouldn't it?

Did you know that...

-Now that the Boston Harbor is cleaner, Harbor seals and porpoises are returning in larger numbers.

-Now that the Harbor is cleaner, certain birds that once lived there have moved someplace else. A mollusk that formerly grew on the Harbor floor has left because the sludge and pollution that it ate is gone. So once the mollusks' food supply went, the mollusks themselves left and the birds that ate the mollusks left as well. Interesting.

-Several years back when the harbor was dirtier, there wasn't as much salt in the harbor. It was mainly pollution. But now with improved harbor quality the levels of salt have increased dramatically.

-The level of salt in water is known as the level of salinity.

-A mollusk is any shelled marine animal; such as snails, clams, crabs...

-The big egg digesters act like a big stomachs, only they're for the Harbor. There are little bacteria that break down the sludge so that it can pass through the rest of the process with ease.

Preservation/ Education/ Geology/ History...

The general consensus at the Charrette was that we should "share the islands" with the birds and other animals that exist on the islands already. Humans are guests in their home, not the other way around. We want animals to be around on the islands for our kids to see and enjoy. Harming one animal species could disrupt an entire ecosystem. Some ways to educate people and preserve the islands is to:

- ✧ Educate island visitors both before and after they arrive on the islands.
- ✧ Post and announce on loud speakers on the boats as visitors are travelling to the islands about basic island regulations.
- ✧ Place small displays of the wildlife that exist on that particular island. This could foster awareness and respect for the island's ecology.
- ✧ Create an interactive "eco-station" on the island just before you hit the trails where people can get a broad overview of what they are about to experience.

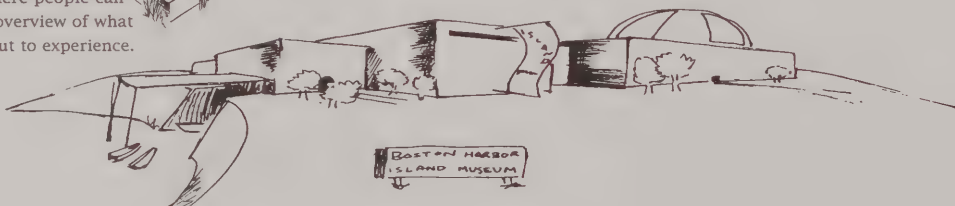
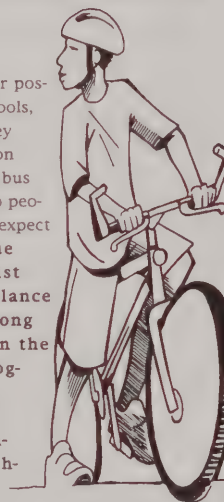


Charrette participants in general agreed that while reading about the islands and their ecology is one way to learn about them, it is much better to get out and "live" the island first hand (i.e. actually exploring a salt marsh or feeling and seeing a bayberry bush). To run hand in hand with this idea, one well received suggestion was building a museum on a central, accessible island that can be developed. The museum would encompass the many diverse aspects of the islands including: natural history/ geology, current ecology, archeology, Native American history, Colonial history, history of immigrants on the Islands; past, present and future states of the Boston harbor; military history of the islands and the myths and stories encompassing the Islands.

The overall theme for preservation, education, geology and history is to foster awareness and respect for the islands and their incredible history. Introduce and repeat the message when-

ever and wherever possible... in the schools, on duck and trolley tours of the city; on walking tours; on bus and train signs so people know what to expect on a visit. "A true environmentalist respects the balance of interests among all life forms on the planet and recognizes that some interests are at times more compelling than others."

Author Unknown.



APPENDIX 14: GLOSSARY

access—Includes physical access and management of access on both islands and mainland. Applies to water transportation, land transportation, parking, connecting trails, financial, proximity to public transit lines, etc.

adaptive use—A use for a structure or landscape other than its historic use, normally entailing some modification of the structure or landscape.

camp site, primitive—A completely carry-on, carry-off site; “leave no trace” (composting toilets).

camp sites, improved—Potable water and other camping amenities provided.

ecosystem management— Refers to the interdependence of natural and cultural systems, integrating scientific knowledge of ecological relationships with resource stewardship practices.

environmental assessment (EA)—A concise public document prepared by a federal agency to satisfy the requirements of the National Environmental Policy Act of 1969, as amended. The document contains sufficient analysis to determine whether the proposed action (1) constitutes a major action significantly affecting the quality of the human environment, thereby requiring the preparation of an environmental impact statement, or (2) does not constitute such an action, resulting in a finding of no significant impact being issued by the agency.

environmental impact statement (EIS)—A detailed public statement required by the National Environmental Policy Act when an agency proposes a major action significantly affecting the quality of the human environment. The statement includes a detailed description of the proposed action and alternatives, as well as the identification and evaluation of potential impacts that would occur as a result of implementing the proposed action or alternatives.

general management plan (GMP) — (NPS term) A document that provides clearly defined direction for a park for resource preservation and visitor use over 15 to 20 years. It gives a foundation for decision-making and is developed in consultation with program managers, interested parties, and the general public. It is based on analysis of resource conditions and visitor experiences, environmental impacts, and costs of alternative courses of action.

gateway— A mainland waterfront location providing boat service and visitor orientation to the islands. Gateways should be located near public, multi-modal transit systems including highways, bikeways, and ferries; provide parking; and contain uniform park identity and directional signs, and visitor amenities such as seating and shade shelters. Some gateways may be staffed and contain a visitor contact station and sales of souvenirs and park-related items for visitor comfort and information.

hub— term used for the islands where ferries arrive from the mainland. They may have a lot of activities; and can accommodate many people. Hubs would provide orientation to the islands, have food, restrooms, water, and possibly sales items related to the islands.

integrated resource management plan — The term used in the enabling legislation for a general management plan.

management plan— The statute establishing the Boston Harbor Islands National Recreation Area calls for an “integrated resource management plan” for the park. This name has been shortened to management plan, and it is the same as a “general management plan” in the National Park Service. Such a plan is expected to provide viable policy guidance for 15 to 20 years.

mission goals (NPS term; formerly called management objectives)— Goals stating the ideal conditions to be attained or maintained; expressions of desired future conditions. Together with the mission statement, they precede and direct decisions about specific park conditions.

mission statement (NPS term)—A concise statement that incorporates park purpose (the specific reasons the park was established) and significance (a description of the park’s distinctiveness and importance nationally).

project manager (NPS usage)—In the Boston Harbor Islands national park area, equivalent to a superintendent.

preservation—The act or process of applying measures to sustain the existing form, integrity, and material of a historic structure, landscape, or object. Work may include preliminary measures to protect and stabilize the property, but generally focuses on the ongoing preservation, maintenance, and repair of historic materials and features rather than extensive replacement and new work. For historic structures, exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

rehabilitation—The act or process of making possible an efficient, compatible use for a historic structure or landscape through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, and architectural values.

restoration—The act or process of accurately depicting the form, features, and character of a historic structure, landscape, or object as it appeared at a particular period of time by means of removing features from other periods in its history and reconstructing missing features from the restoration period.

stabilization—An action to render an unsafe, damaged, or deteriorated property stable while retaining its present form.

sustainability—A process that integrates economic, environmental, and equity (health and well-being of society) activities in decisions without compromising the ability of present and future generations to meet their needs.

viewshed—The area that can be seen from a particular location, including near and distant views.

water shuttle—Small vessel operating between islands on an established schedule.

water taxi—Small vessel available for hire, on-call, for short trips between mainland and the islands.

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Lance Campbell, Boston Redevelopment Authority; Chang-Ming Chen; Friends of the Boston Harbor Islands; John Forbes; R. Hasenstab; Alex S. MacLean, Landslides; Ken Mallory, New England Aquarium; Metropolitan District Commission; National Park Service; John Nove; Save the Harbor/Save the Bay.

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